JULY 28, 1958

STEEL
The Metalworking Weekly

A PENTON PUBLICATION

So You Want to Escalate . . .

It's a growing practice. But know the index before you tie into it . . . Page 38

• Miniaturization: What It Is

The 'when, if, and why' of making things smaller . . . *Page* 44

• Saved: $28.60 a Part

Another top entry in the Cost Crisis competition . . . *Page* 64

• Coatings Boost Metal Life

They resist corrosion and extreme temperature . . . *Page* 66

• Detroit Buys Steel Again

Automakers place first big orders for '59 models . . . *Page* 91

it's mainly a matter of TIMING!

Knowing WHEN to replace a machine saved one manufacturer $16,794 a year

TAKE ANY machine in your plant. You know that some day it will have to be replaced. But *when?* That is the big question. And wrong answers probably cost American Industry millions of dollars every year.

For any machine, there is one optimum replacement time—the time when it can be replaced with a new one at *lowest overall cost.* And it can't be determined by haphazard methods. Guesswork, intuition or rule-of-thumb computations will be wrong most of the time. And even some obsolescence formulas are not above suspicion. But you can put a dollar sign on every variable involved, and come up with a precise figure that will mean a major saving in production cost and capital investment.

Heald sales engineers are well experienced in making obsolescence studies to determine when a machine should be replaced. Sometimes it is found that replacement is overdue. And often it can be shown that next year or the year after would be better for the customer. If you would like help in planning your replacement program, or want to confirm your estimates for a particular machine, just call in your Heald engineer. Similar studies have pointed the way to many important savings.

For Example: A manufacturer of aircraft instruments had been using a 5-year-old precision lathe to perform boring, turning and facing operations on instrument cases. But when this was replaced with a new Heald Model 0 Unit-Type Bore-Matic like that shown at the right, operating costs for the same production were immediately reduced by over 78%. In addition, the elimination of a separate burring operation and reduced assembly time made further important savings, as indicated by the cost analysis below.

	Old Machine	New Machine
Parts per hour	4.3	20
Parts per year (Req'd. Prod.)	10,000	10,000
Direct and Indirect Labor, per year	$20,349	$ 6,055
Scrap Losses, per year	$ 500	$ 300
Annual Maintenance Cost	$ 600	$ 300
Annual Operating Cost	$21,449	$ 6,655
Basic Annual Saving, New Machine		$14,794
Additional Saving from elimination of separate operation		$ 500
Additional Saving from reduced assembly time		$ 1,500
Total Saving Per Year		$16,794
Return on Investment for New Machine		84%

YOU pay for obsolescence. Replacement pays for itself!

THE HEALD MACHINE COMPANY

Subsidiary of The Cincinnati Milling Machine Co.

Worcester 6, Massachusetts

Chicago • Cleveland • Dayton • Detroit • Indianapolis • New York

HEALD

A Truckload of Potatoes

Once upon a time there was a Diligent Housewife.

She was paying 8¢ a pound for potatoes.

One day a farmer stopped by with a truckload of potatoes. "Lady," he said, "if you buy the whole truckload, you can have 'em for 4¢ a pound."

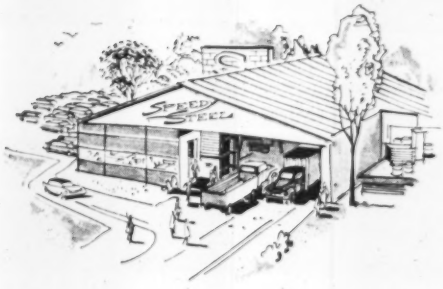
Now, our Heroine had a nose for a Bargain. "I'll take them," she said, and wrote out a check for $107.36.

"Dump them in the garage," she said.

She lived to regret her rashness. Her Hubby was fit to be tied. He couldn't get his car into the garage for 2½ years. What's more, Diligent Housewife always had the dickens of a time digging out just the right size potato.

Besides, Hubby grumbled about how their money could be collecting interest at the Bank if it weren't tied up in potatoes.

Finally, Diligent Housewife hung this Motto in her kitchen:



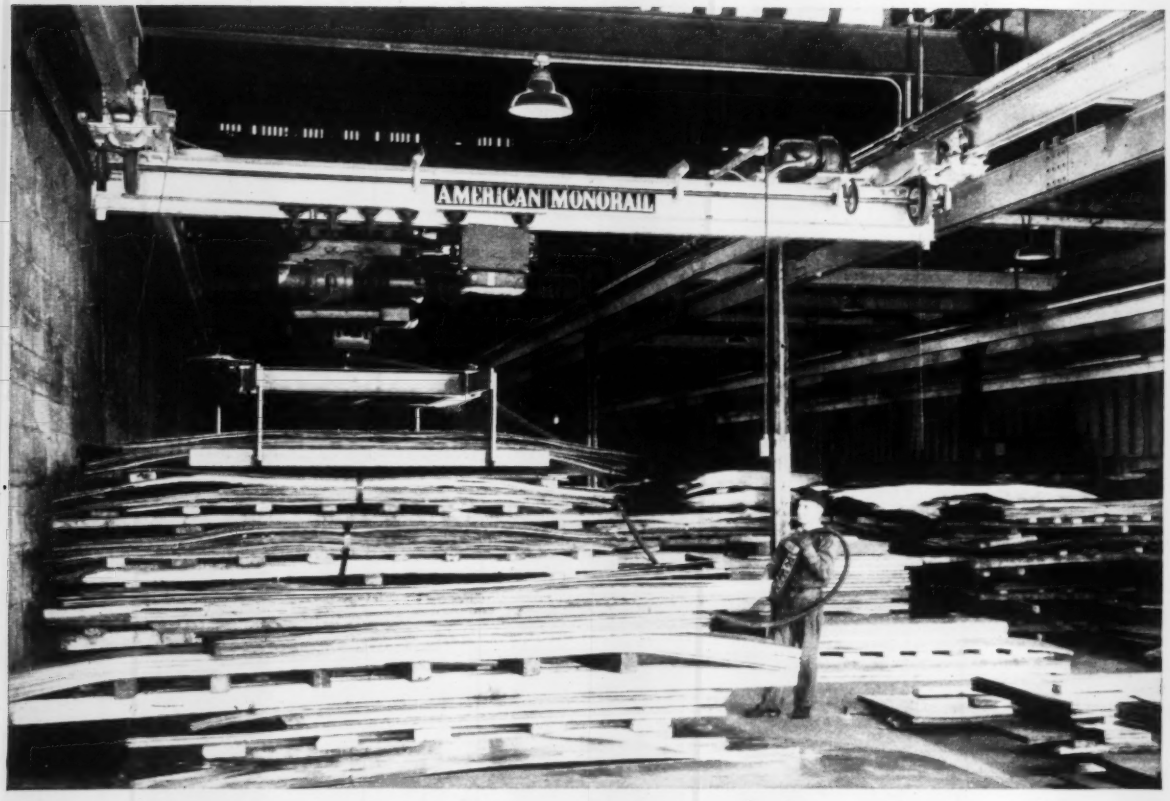
Many steel users long ago learned the same lesson. When they need steel in small or moderate lots, they get it from their local steel warehouses, *when they need it*, and *in the sizes they need*. Always remember your "Service Center for Steel."

At the 1958 Annual Meeting of the A.S.W.A., this message won the Producer Award for the best single advertisement in the interest of America's steel service centers.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.
On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation
Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL



Reduce *"Manufacturing Overhead"*
...by Going Overhead
with AMERICAN MONORAIL

REDUCE
educe indirect mfg. costs
liminate re-handling
amage to floors eliminated
tilize larger production units
ontrol work flow
xpedite production

MFG
inimize employee fatigue
ull use of plant cubage
ain full use of floor space

COSTS
ut "down time"
vercome floor hindrance
ecure flexibility in material movement
ransfer loads without re-handling
afety for the employee

An American MonoRail system will bring a quick reduction in manufacturing costs because it can do all the things listed at the left.

Overhead handling puts your ceiling space to work—leaves your floor free of traffic—helps you produce more efficiently in less space.

American MonoRail engineering consultants are available without obligation for the solution of your handling problems.

Write for Bulletin C-1 illustrating hundreds of successful MonoRail installations.

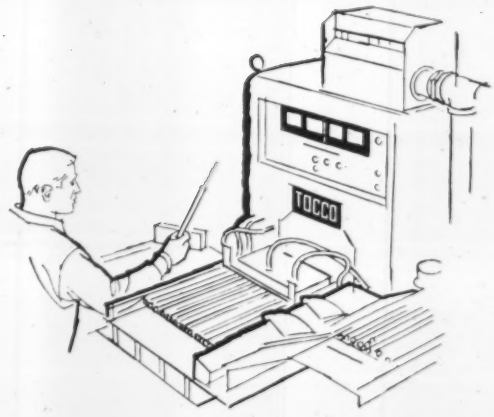
AMERICAN MONORAIL

ENGINEERED MATERIALS HANDLING

13102 ATHENS AVENUE
CLEVELAND 7, OHIO

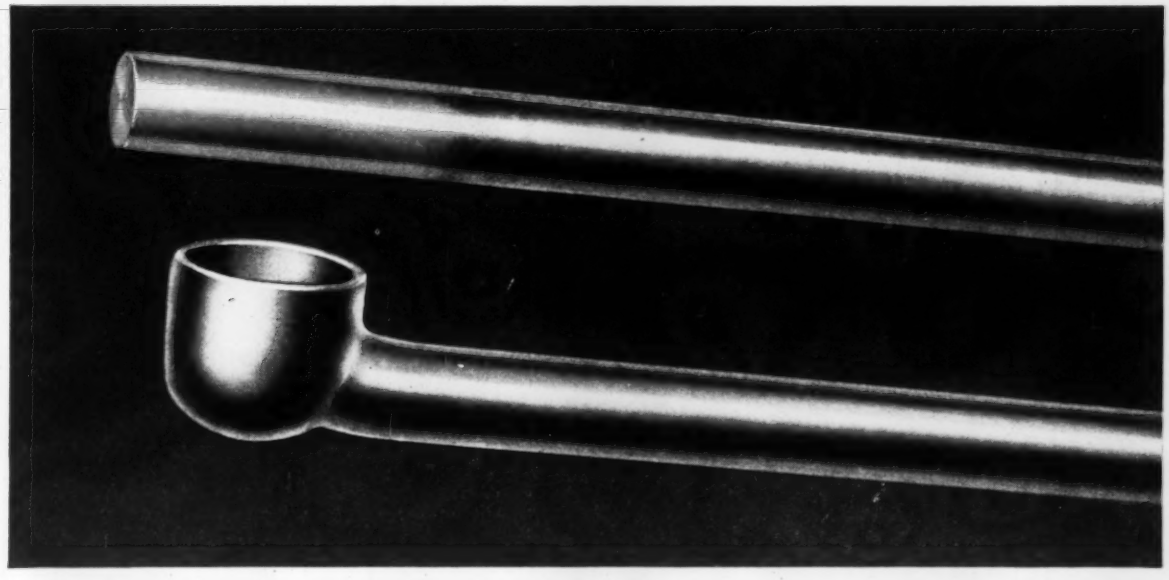
OVERHEAD HANDLING EQUIPMENT

MEMBER OF MATERIAL HANDLING INSTITUTE AND MONORAIL MANUFACTURERS ASSOCIATION



Heating Costs Cut In Half

with TOCCO* *Induction Heating*



Engineers at Thompson Products Inc.'s Michigan Division recently changed from gas-fired furnaces to fully automatic TOCCO. Application: heating for forging of automotive tie rods. Result: a substantial reduction in direct labor costs, saving thousands of dollars a year on this heating for forging operation. *Annual savings actually amortize the cost of the TOCCO installation in about one year.*

The automotive tie rod shown here is only one of over 500 parts heated for forging in Thompson's new, modern forge plant. *Every one of these parts is heated with TOCCO equipment.*

If *your* manufacturing operations require heating for forging, heat treating, brazing, soldering or melting, it will pay you to investigate TOCCO as a sound method of increasing production and lowering costs.

THE OHIO CRANKSHAFT COMPANY

Mail Coupon Today— NEW FREE Bulletin

The Ohio Crankshaft Co. • Dept. S-7, Cleveland 5, Ohio

Please send copy of "Typical Results of TOCCO Induction Heating for Forging and Forming".

Name_____

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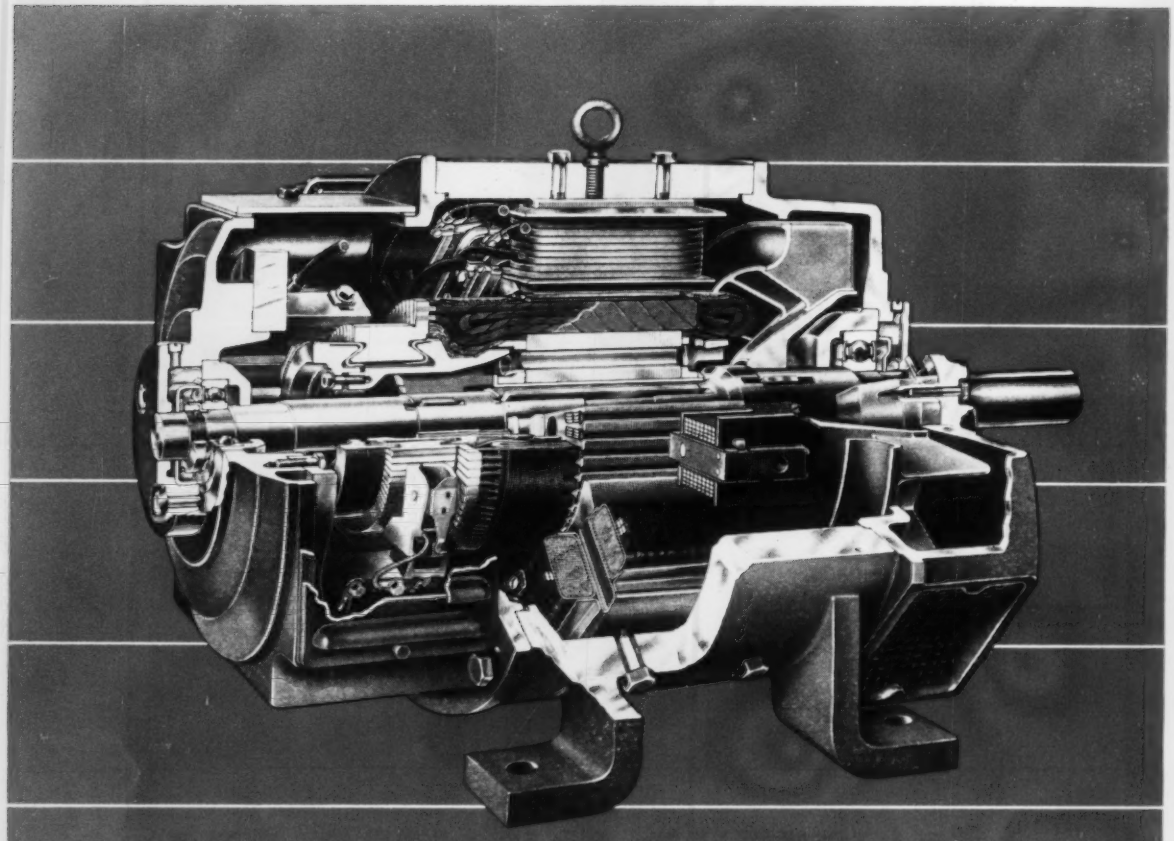
Address_____

City_____ **Zone**____ **State**_____



THE RELIANCE SUPER 'T'

A New Kind of D-c. Motor With DYNAMIC RESPONSE

Here is a motor built to make maximum use of d-c. flexibility. The Super 'T' puts Dynamic Response into starts, stops, and speed changes. Dynamic Response gives you a 50% increase in torque and a 50% decrease in reaction time.

This top performance is due to advanced balanced design. Lighter, small diameter armatures cut mechanical inertia 50%. Superior Class B insulation, gives extended life even at temperatures as great as 130°C.

Top grade insulation plus engineered ventilation lets the Super 'T' take tremendous overloads. In fact, the Super 'T' can develop double normal horsepower during starts, stops, and speed changes.

The Super 'T' is a compact power package, designed inside and out for tough industrial service. From appearance to performance, the Reliance Super 'T' with Dynamic Response is today's most modern industrial motor.

C-1377

RELIANCE ELECTRIC AND ENGINEERING CO.

DEPT. 47A1, CLEVELAND 17, OHIO
CANADIAN DIVISION: TORONTO, ONTARIO
Sales Offices and Distributors in principal cities

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July 28, 1958
Vol. 143 No. 4

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Anti-inflation program of Committee for Economic Development won't work well. Individual action is key.

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Increase in the popularity of escalation is tremendous, both in labor and sales contracts, because of inflation. Representing an age-old desire to hedge against or predict the future, any such move should be done with care. Know your index.

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Willys Motors is taking new fling into small car field, this time in Brazil. Production will start in '60.

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Consumer may duplicate his 1954 performance as a recession buster. He's beginning to open his pocketbook again.

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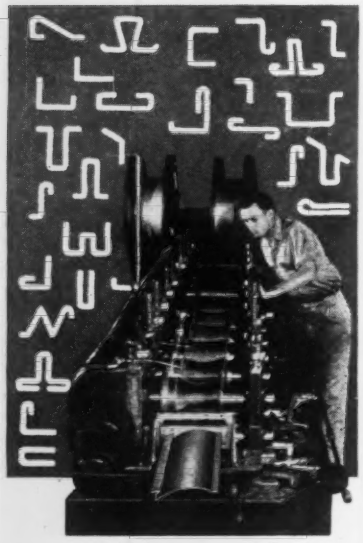


With a YODER . . .
ONE MAN PRODUCES
30,000 FEET OF
SHAPES A DAY!

Cold-roll forming with a Yoder Roll-Forming machine makes spectacular production possible in many metalworking applications and industries.

A multitude of shapes, simple or complex, produced from a wide variety of coated or uncoated stock, and destined for a virtually endless list of purposes, can be easily, quickly and economically produced with a Yoder cold-roll forming machine.

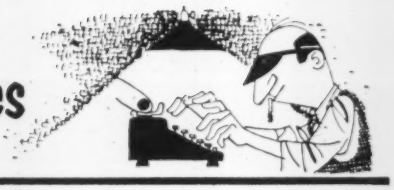
Whether it be moldings, structurals, siding, roofing, tubulars, cabinet shells, or any one of a thousand requirements, it can be quickly produced with accuracy and uniformity the Yoder way. The conversion cost is usually so low that even part-time operation makes a Yoder cold-roll forming line a profitable investment.

A great many modifications of the basic shape such as welding, coiling, ring forming, notching, perforating, embossing and cutting to length, can be simultaneously introduced with little or no additional labor cost. It will pay you big dividends to fully investigate the advantages of Yoder cold-roll forming. A fully-illustrated, 88-page book clearly discusses every important aspect of this amazingly versatile method of metal fabrication... it is yours for the asking.

THE YODER COMPANY
5502 Walworth Ave. • Cleveland 2, Ohio

ENGINEERING YODER MANUFACTURING
COLD ROLL FORMING MACHINES

behind the scenes



Modern Sinews of War

Just as the human mind fumbles with the concept of interstellar space, so it seems to short-circuit itself when confronted with the idea of an electronic and atomic age. What we are about to report concerns things of such great pith and moment, involving the structure of the universe and the destiny of man, we feel constrained to be as objective as possible. So let's start with a mess of fried jack rabbits, shall we?

It all began early in July, when about 400 persons assembled at the White Sands Missile Range, in the harsh wastes of southern New Mexico. They represented top Army, NATO, and industrial brass, with a sprinkling of communication experts, sometimes lightly referred to as gentlemen of the press. They saw the Army shoot off a frightening array of limited range stuff, which churned up the alkali flats for miles around, including chunks of the inhabitants thereof, which were mostly jack rabbits.

Editor Walt Campbell attended as a guest of U. S. Steel Corp., one of the primary contractors engaged in the manufacture and assembly of erecting and launching equipment.

Old Army Outdated

"They didn't shoot off the big stuff," he said. "You know, the intercontinental and space missiles, but I can tell you the things they did shoot off really made you think two or three times. At one time I was sitting next to a three-star general—or was it four? Why, there were so many stars around, one of the group tried to estimate the number and got lost. Well, this general turned to me after a while, and said, 'Man, am I glad I'm so close to retirement! Why, I'm so confused with the potentials of modern tactics and materials I wouldn't know an attack from a retreat!' It was true, too. What with missiles and rockets, including homing killers that pursue their targets, I don't know what a general might do if he were only half an hour out of date!"

Campbell's other recollections make good conversation pieces. For instance, most of the best brains in this awesome military engineering business burgeon under vigorous young crew cuts. Most of the scientists are distressingly young but obviously heavily decorated with academic honors. Generals and admirals look upon them with the astonished wonder noted in a hen that has hatched a clutch of hawks.

Concerning hawks, Walt described a homing missile called a Hawk. "This thing has something in its nose that keeps it right on the track of its target," he explained. "We were told that a jet fighter, radio controlled by two mother planes, was approaching at about 650 miles an hour. At a certain point ground radio was supposed to take over, the Hawk would be launched, and the mother planes would make themselves scarce. You see, the Hawk can't distinguish friend from foe, and nobody in his right mind wants a Hawk coming after him, particularly when an escaping speed of 650 miles an hour is no more effective than the speed of a falling leaf."

"What happened? Did the jet come in on schedule? Did the mother planes escape? Did the Hawk strike?"

"You sound like a radio announcer, talking about next week's serial. Of course the Hawk struck. But let me tell you what happened first. Somewhere along the line, after the mother planes took off for lots of open space, we learned that the ground radio control wasn't working and that a jet was whipping around somewhere all by itself at 650 miles an hour. I asked the general what would happen if it hit the stands, but he wouldn't tell me. Then I said that I guessed if it did there would be a lot of promotions in the Army the next day, but I could see that he didn't think that was funny. Of course, I didn't think it was funny, either, but you'd be surprised at what a lousy conversationalist a man becomes under those conditions."

"The Hawk, man; what about the Hawk?"

"Ah, that ever-lovin' Hawk! It went off like a streak; you could see it pretty clearly, too. It went after that jet just as if it had intelligence. When it got real close, it seemed to do a corkscrew, whipped into the jet, and all we could see was a puff of smoke over the desert."

Praiseworthy Occupation

The metalworking industry has a tremendous stake in national defense. It also has a tremendous responsibility. The primary contractors of missiles, components, transportation, erection and launching facilities were delighted at the success of their efforts at the White Sands Range. We thought you would be glad that they were delighted because if their projects had failed to measure up to military expectations, you would never read about U. S. forces landing with confidence on the shores of foreign countries.

Shrdlu

(Metalworking Outlook—Page 27)

Morrison Steel Products
draws and stamps countless specialty items from Youngstown Cold-Rolled Sheets in their spacious Buffalo, N. Y. plant.

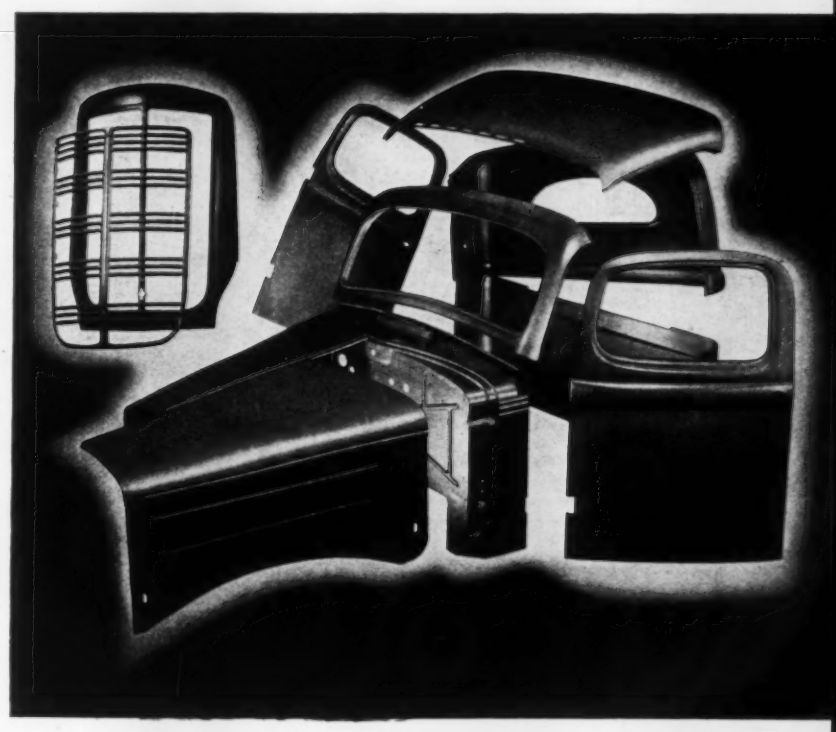
Accent on Excellence

Youngstown cold-rolled sheets

In 1912, Morrison Steel Products, Inc., of Buffalo, were fabricating automobile fenders for custom-built Pierce-Arrow motor cars. Today they have grown into a major contract producer of quality stampings and drawn steel specialties—ranging from overhead garage doors to defense items such as jet engine nose rings.

Perhaps your lawnmower, car door, heating furnace or other products that make life a bit easier, are assembled from Morrison stampings—which begin with the best in basic material, Youngstown Cold-Rolled Sheets.

Wherever steel becomes a part of things *you* make, the high standards of Youngstown *quality*, the personal touch in Youngstown *service* will help you create products with an "accent on excellence".

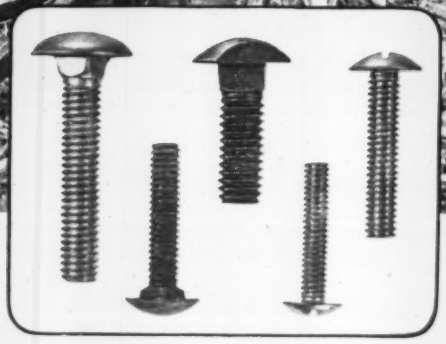


MORRISON STEEL PRODUCTS, INC.
BUFFALO 7, N. Y.

THE
YOUNGSTOWN
SHEET AND TUBE COMPANY

Manufacturers of Carbon, Alloy and Yoloy Steel, Youngstown, Ohio

NEW IDEA PROTECTS INCREASED CAPACITY PERFORMANCE WITH REPUBLIC FASTENER PRODUCTS

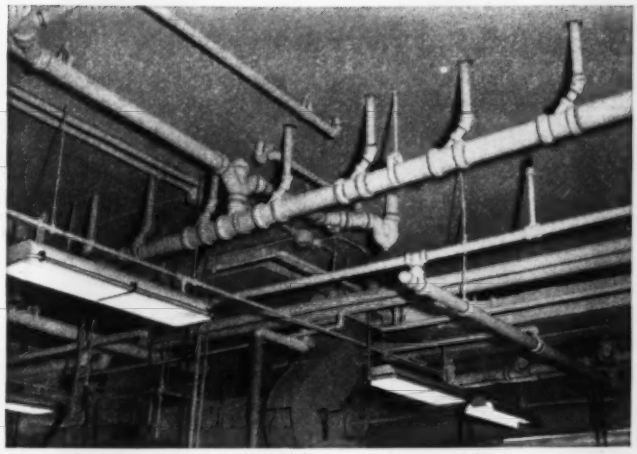


MODERN, *NEW IDEA* TWO-ROW CORN PICKERS use a wide variety of Republic Fastener Products. Typical types are shown in inset. Republic Fasteners assemble easily and assure dependable, long-term holding power . . . the basis for maximum safety and trouble-free performance.

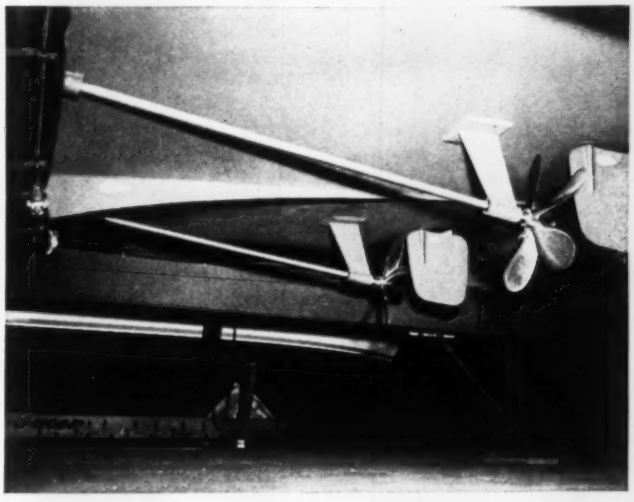
NEW IDEA Division, Avco Mfg. Corp., Coldwater, Ohio, takes pride in producing agricultural equipment designed to meet the increased efficiency and yield requirements of modern farming. The machine shown above is a good example of how these objectives have resulted in a better-than-ever, two-row corn picker. And the inset shows several types of Republic Fastener Products used to protect designed-in performance objectives.

Because 1200 fasteners are used in each unit, *NEW IDEA* engineers refuse to compromise the time, effort, and money required to produce a safe, reliable product by specifying anything less than the best. Over the years, Republic has established a record of complete dependability plus unexcelled economy. This same level of quality is standard throughout Republic's broad line of fastener products, including 20,000 standard and 8,000 special types and sizes.

Whatever your assembly or product fastening application, it will pay you to protect performance specifications by insisting on Republic Fastener Products. For complete information, contact the Republic office nearest you, or mail coupon.



GOOD PERFORMANCE PLUS ECONOMY provided by Republic Steel Pipe make it ideal for a wide range of industrial piping applications. Illustration shows steel pipe used for steam, air, waste, and sprinkler system lines. Beyond low cost and long life, Republic Steel Pipe permits fast, economical installation. Because each length of Republic Pipe is uniform in strength, ductility, and wall thickness, operations including cutting, threading, bending, and welding are simplified. For complete information on types, sizes, and specifications, contact your nearest Republic Pipe Distributor. Or send coupon.



PROTECTION DURING STORAGE for bulky, uneven, odd-lot, and fragile materials is readily secured using Republic Steel Pallets and adjustable Pallet Racks. Tubular steel supports on racks adjust every six inches to handle palletized material of varying height. Two-way entry permits loading and unloading from either side. Single pallets can be selected from any level without restacking. As a result, handling, stacking, and palletizing are simplified. For data, send coupon.

CORROSION PROTECTION AND VIBRATION REDUCTION are two of the many benefits gained by Roamer Steel Boats, Division of Chris Craft Corporation, Holland, Michigan, through use of Republic Cold Finished Stainless Steel Bars for drive shaft manufacture. Bars meet Roamer's strict, maximum tolerance of .006" run-out in 72" of shafting required to overcome damaging vibration. Moreover, high cross sectional accuracy minimizes necessary machining. Corrosion-resistance of Republic ENDURO® Stainless Steel permits long-term operation in waters where other materials may be severely attacked. High strength-to-weight ratio of ENDURO provides still further advantages. Mail coupon for details.

REPUBLIC STEEL

World's Widest Range of Standard Steels and Steel Products

REPUBLIC STEEL CORPORATION
DEPT. ST-6163
1441 REPUBLIC BUILDING • CLEVELAND 1, OHIO

Please send more information on:
☐ Fastener Products ☐ Cold Finished Stainless Steel Bars
☐ Pallet Racks ☐ Steel Pipe

Name _____ Title _____

Company _____

Address _____

City _____ Zone ___ State _____

Campbell "Customized" Sling Chains

PUT THE ASSEMBLY YOU NEED "YESTERDAY" ON THE JOB TODAY!

Now, the new Campbell "Customized" Sling Chain Assembly Program gives you sling chains as you want them . . . when you want them. Here's how this fast, flexible service works for you. You can: a) maintain your own stock of Campbell component parts; and assemble slings right on-the-job; b) get immediate delivery on assemblies and components from your Campbell Distributor; c) get immediate shipment ordered through your Campbell Distributor on slings made-up at the nearest Campbell Warehouse or Factory.

Campbell Certificate of Test:
Guarantee of Performance

Campbell Certificates of Test protect you both for Campbell component parts, and the complete "Customized" Assemblies you get from your Campbell Chain Distributor or Warehouse. Call your Distributor for details on how the Program meets the requirements of *your* operation.

SEND TODAY for your free copy of
Campbell's "Customized" Sling Chain Brochure No. CSA-1.

CAMPBELL CHAIN

CAMPBELL CHAIN *Company*
York, Pa.—W. Burlington, Iowa
E. Cambridge, Mass.—Seattle, Wash.—Portland, Ore.
Sacramento, San Francisco, Los Angeles, Calif.

LETTERS
TO THE EDITORS

Lauds Editorial

Your editorial, "Russia's Weakness" (July 7, Page 33), not only reflects my own attitude regarding the communist system, but I'm certain it speaks for many other red blooded, God fearing Americans as well.

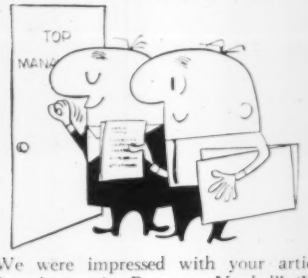
Now that you have spoken out so forcefully and so well on this topic, I should like to suggest another which, to me, seems equally important.

I wonder sometimes if perhaps the American people as a whole haven't forgotten the underlying principles that have contributed to making America the great nation that it is today.

It would seem to me that our chief concern as a free nation should be to keep moral and spiritual decay from destroying our governmental structure. I firmly believe that by placing greater dependence upon God, a "government of the people, by the people, and for the people shall not perish from the earth."

Edward W. Bolles
617 S. First St.
Ann Arbor, Mich.

Apprentice Program Report



We were impressed with your article, "More Apprentice Programs Needed" (July 7, Page 46). We would appreciate 12 copies to distribute to the key members of our joint apprentice training program.

C. T. Hughes
Chairman, Joint Apprentice Committee
Sheet Metal Workers
Buensod-Stacey Inc.
New York

Reader Commends STEEL

We have been reading with considerable interest your 1958 Program for Management articles and are particularly interested in No. 5, "Pricing for Profit" (June 16, Page 87).

You are to be commended for your splendid service to business, large and small, in the publication of these articles.

R. F. Carey
Sales Manager
Buck Mfg. Co.
San Jose, Calif.

Request from Navy

Are there any reprints left of the articles, "Brazing Alloys Tackle Heat Barrier" (May 19, Page 140) and "Powder

(Please turn to Page 12)

TIPS FROM A ROLL MAKER'S NOTEBOOK

MACKINTOSH-HEMPHILL DIVISION, E. W. BLISS COMPANY, Pittsburgh 3, Pennsylvania

Cast mill rolls • Johnston cinder pots • rotary tube straighteners • end-thrust bearings • heavy-duty lathes • steel and special alloy castings

Tooling: key to longer roll life between redressings

Most difficult roll turning job done regularly at Mack-Hemp is dressing pipe mill rolls. Turning takes a week or more, with carbide tools reground three or four times per hour.

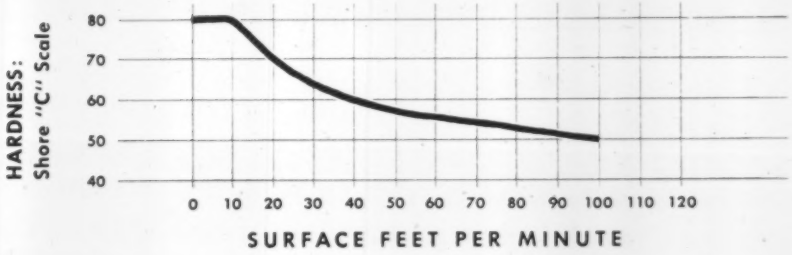
In a very important sense, block lathe turning practice sets the upper limit on the production-per-turn of every rolling mill in a plant. The reason is obvious. If the roll shop won't turn rolls whose hardness is above a certain figure, then the extra wear resistance of these harder rolls can never be brought into play.

In investigating roll shop machining techniques, we've found that many roll shop men are often not fully informed of the remarkable increases in turning speeds, feeds and depths of cut made possible by carbide tools. High speed cutting tools can dress rolls of hardness up to approximately 68 Shore (C scale), but carbide tools can cut harder rolls up to and including pipe mill rolls that are nearly 80 Shore. A set of these extremely hard rolls recently rolled 3500 miles of pipe between dressings!

Higher turning costs can pay dividends

At these higher-hardness levels, turning a large roll takes time and care; correct speeds must necessarily be selected and feeds are sometimes reduced to only a few thousandths of an inch. And even with a comparatively low rate of metal removal, the cutting tools must be reground after every few hundred surface feet. Three to four tools are worn out on every roll. *But* . . . the dividends in service life pay for the turning costs many times over.

Since Mack-Hemp specializes in rolls, roll turning and large roll contouring lathes, our experience in these three fields together with our awareness of the high tonnages available from the harder roll grades, helps us to make intelligent recommendations to our customers' best advantage. Suggestion: if you have had difficulty in the turning of hard rolls and want to explore their use in your mills, why not give us a call? Address Mackintosh-Hemphill Division, E. W. Bliss Company, 901 Bingham Street, Pittsburgh 3, Pa.



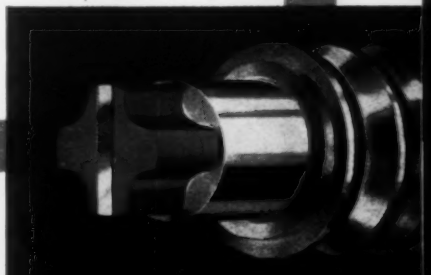
Cutting speeds (approximate) used by Mack-Hemp's machining department. Feeds and depths of cut vary widely depending on the roll and the power of the lathe available. These speeds are offered simply as a guide and should be adjusted to individual requirements.

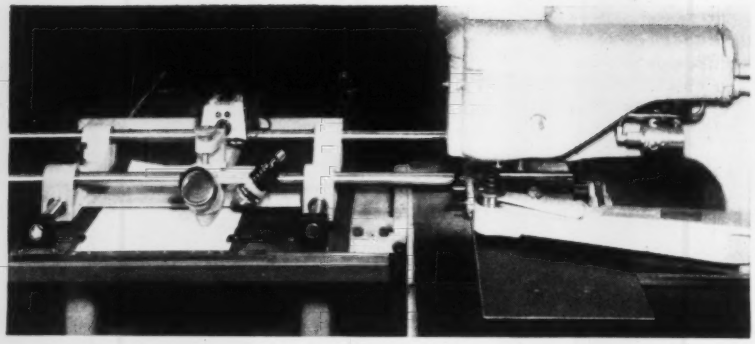
MACKINTOSH-HEMPHILL

You get more tonnage from the rolls with the Striped Red Wabblers

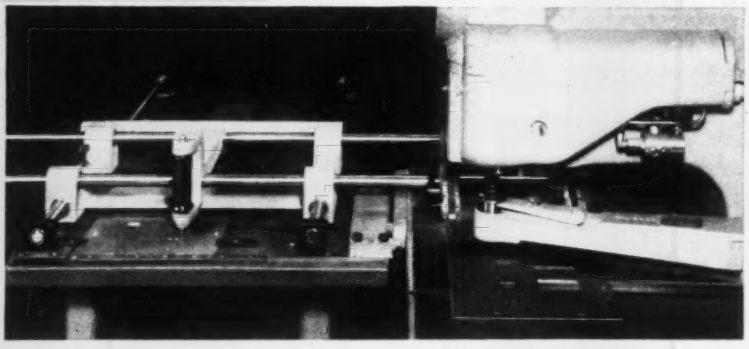
Division of E. W. BLISS COMPANY

Presses, Rolling Mills, Special Machinery





shortest distance
between blueprint and product



The DUPL-O-SCOPE

Firms punching or notching sheets up to ¼" mild steel in medium runs know how profitable it is with a Strippit Fabricator-Duplicator. Now, it's even faster with the new Dupl-O-Scope, which eliminates the template drilling and layout step!

Readily mounted in the Duplicator stylus bracket, this precision optical pickup device quickly translates a drawing, layout or printed circuit sample into a punched metal template — ready for rapid-fire punching and notching on the Fabricator-Duplicator using standard interchangeable tools or "specials" made up to your requirements.

Write today for catalog and an actual demonstration on *your* work at *your* plant by a Strippit Mobile Unit. Warehouse stocks at Chicago and Los Angeles.

The versatile Strippit Fabricator, one-machine shop for quick-change punching, notching and nibbling — available with positive Duplicator for high-speed production punching and notching in complex patterns including printed circuit boards.

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STRIPPIT
Company
210 Buell Road, Akron, New York
In Canada: Strippit Tool & Machine Limited, Brampton, Ontario

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LETTERS

(Concluded from Page 10)

Parts Made Without a Press" (Page 162)? I would appreciate one copy of each.

Carl Ferguson
Head, Materials Laboratory
U. S. Naval Avionics Facility
Department of the Navy
Indianapolis

Stalemated? Try OR

I would appreciate receiving a copy of the article, "Stalemated? Try This Move" (June 30, Page 60).

Raymond K. Hildebrandt
Factory Manager
Standard Steel Works
Division of Baldwin-Lima-Hamilton Corp.
Burnham, Pa.

• • •

We would be pleased to receive an additional copy of "Operations Research Solved These Problems."

P. B. McCrodan
Assistant Manager
Projects Div.
Falconbridge Nickel Mines Ltd.
Toronto, Ont.

Tailormade Executives

Kindly forward a copy of the article, "Building Better Bosses" (July 14, Page 64).

W. J. Cherones
Manager of Electrical Engineering
Harnischfeger Corp.
Milwaukee

New Titanium Alloys

Please send two copies of the article, "Titanium Gets Ready for Space Age" (July 14, Page 116).

H. M. Lundstrom
Service Engineer
Mallory-Sharon Metals Corp.
Niles, Ohio

Tar Bonds Introduced to U.S.

I was interested in the article, "Tar Bonds Oxygen Vessel Bricks" (July 7, Page 74), and would appreciate a copy.

John R. Gardner
Market Research Analyst
A. P. Green Fire Brick Co.
Mexico, Mo.

Space Age Metals Data

I enjoyed reading your article, "Needed: Facts on Space Age Metals" (June 16, Page 102), and would appreciate a reprint.

Carroll Novicki
Engineering Dept.
Dale Products Inc.
Columbus, Nebr.

Automated Forgings

Where can I obtain the British Iron & Steel Association report on automated forgings mentioned in your Technical Outlook of June 30 (Page 79)?

D. J. Asquith
Chief Metallurgist
Moore Drop Forging Co.
Springfield, Mass.

• *Write: Information Officer, British Iron & Steel Research Association, 11 Park Lane, London, W. 1, England.*

NEW
Heavy-Duty Torque Converter Trackmobile
• switches, spots 'n' hauls freight cars at lowest cost
• pulls 4 loaded cars from a standing start
MWR 1344
The Ball Line

5TM Trackmobile

MOVES MORE CARS–QUICKER, EASIER!

Here's robust power to switch, spot and haul freight cars. Energetic *new* 5TM Trackmobile quick-changes from road wheels to rail wheels and back again to put cars where they're needed—when needed. Built for day in, day out punishment, 5TM never says quit. Its hefty torque converter and engine mean muscle control at its smoothest – *gliding* strength to pull a string of loaded freight cars.

Production never lags when industry's toughest convertible is on the move and *moving*. And just like Models 3TM and 2TM "three moves a day make it pay." Ask for your copy of the new 5TM Trackmobile Bulletin now. *Whiting Corporation, 15643 Lathrop Avenue, Harvey, Illinois.*

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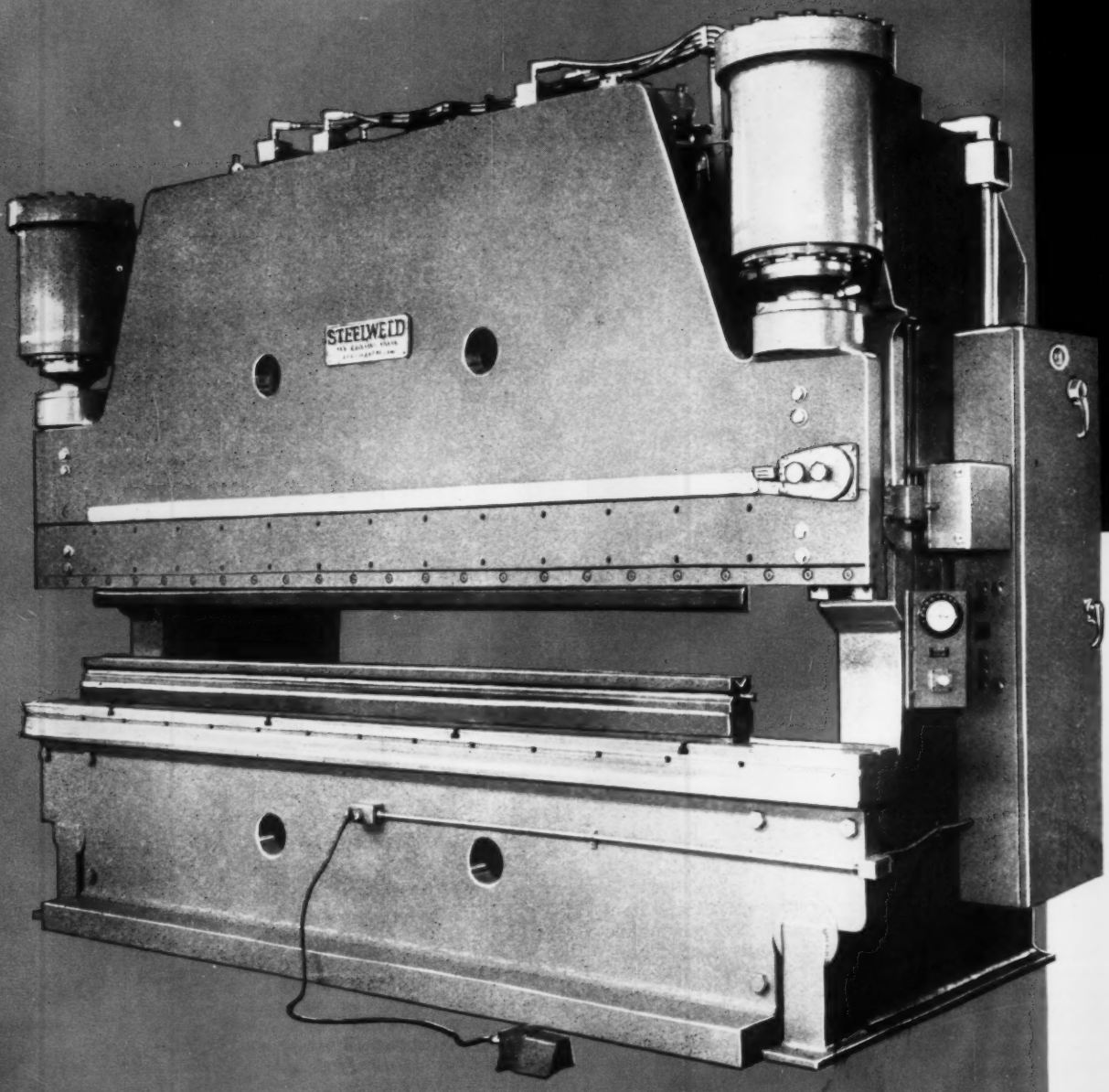

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NEW LINE of

STEELWELD HYDRAULIC PRESS BRAKES

Capacities to 2000 Tons

- Positive overload protection.
- Constant power during entire stroke.
- Ram reversible at any point.
- Stroke quickly adjusted for any length.
- Fast ram approach and return—slow-speed pressing.
- Operating pressure simply adjusted.
- Accurate ram level automatically maintained.
- Ram easily tapered.
- Simple, safe to operate.

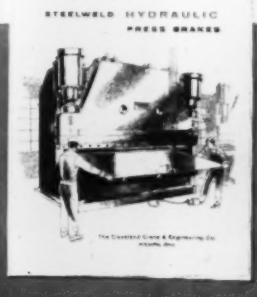
CLEVELAND CRANE is proud to present its completely new series of Steelweld Hydraulic Press Brakes for bending mild steel from 10 gauge to 2 inches and in lengths to 30 feet.

Heavily built and of finest quality throughout, the machines are of the most advanced design with all features found desirable for ease of operation, maximum production and outstanding performance.

Steelweld hydraulically operated brakes are versatile machines capable of handling a wide variety of operations. They are ideal for jobbing shops, as well as for mass-production work. They work to close tolerances and have ample speed.

The new line of hydraulic brakes supplements the Steelweld line of mechanical press brakes, which Cleveland Crane has been building for more than 25 years, but does not supplant it. Each type of machine has its advantages and careful consideration must be given to the specific application to determine the type and size machine most suitable.

We urge you to get the facts on these new machines that have so much to offer you. Our sales engineers will be glad to give you the details. Or write for our new catalog below.



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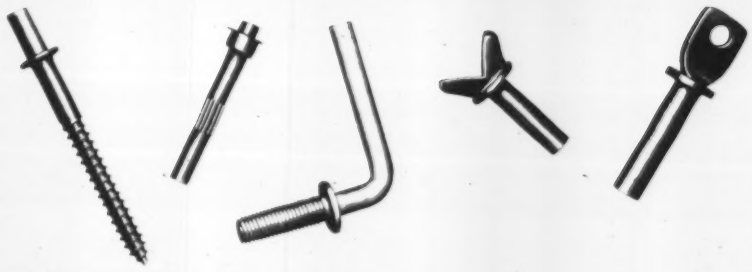
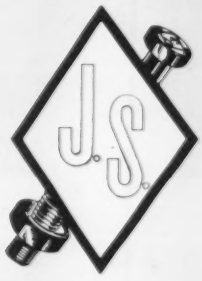


Consistent Quality Reduces Costs...

KEYSTONE XL WIRE STUDY



J. Schwartzman Mfg. & Supply Co. achieves savings 5 ways with KEYSTONE XL WIRE

J. Schwartzman, who heads the manufacturing company bearing his name, is a strong booster of Keystone "XL" Wire. His plant at North Hollywood, Calif., manufactures millions of fasteners of every shape and description. He points out that Keystone "XL" Wire helps cut costs and improves quality in these five ways:

- Increased die life
- Longer production runs
- Fewer rejects
- Better surface for plating
- Excellent heat treating qualities because of consistent chemical analysis

Here's an example of how Keystone "XL" Wire's *flowability* and consistent quality have reduced costs at Schwartzman Mfg. & Supply Co.: a particular square head set screw formerly cost $9.00 per 1000 to produce . . . now with Keystone "XL" Wire the cost is reduced to $3.50 per 1000 . . . a savings that Schwartzman passes on to the customer. *Flowability* is the secret.

Increased savings and quality like this may be possible on the fasteners or parts that you manufacture, too. It's easy to find out . . . just call your Keystone Representative for the complete story. He will help you investigate the many money-saving applications of Keystone "XL" Wire.

Keystone Steel & Wire Company, Peoria, Illinois

KEYSTONE
WIRE FOR INDUSTRY

Keystone Steel & Wire Company
Peoria 7, Illinois

COLD HEADING FACTS FOLDER . . . send coupon today! New folder discusses uses, applications, methods, technical facts, wire requirements.

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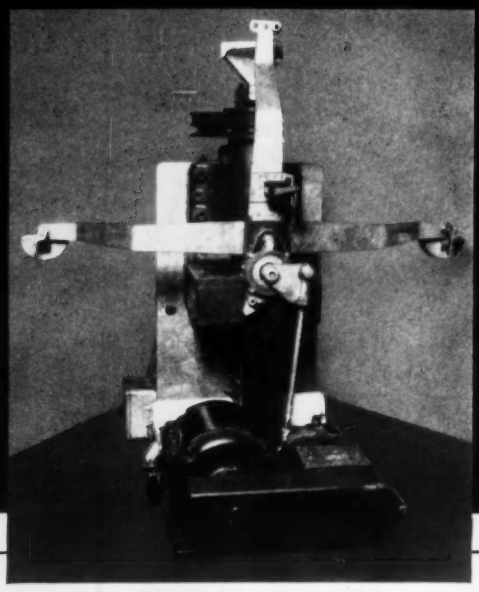
CLEVELAND is the name and the place for ABRASIVES

Why not buy Abrasives on Fact?



Here at Cleveland, we feel that a buyer of metallic abrasives should be able to do just that.

The breakdown tester we use is shown herewith, and it's designed to separate the fact from the fiction.

After 100 passes through this tester, at 7200 r.p.m., we *know* how good our abrasives are and how long they will last.

This tester, combined with our other extensive laboratory equipment, is an integral part of our production control system.

All of it, of course, is working hard every day to give you top-quality, long-life, economical Metallic Abrasives . . . based on fact.

There are more details in our catalog, which is yours for the asking.

COMPARATIVE TEST REPORT

MATERIAL TESTED — S660 CHILLED IRON SHOT

A – Cleveland Metal Abrasive B – Competitors C – Competitors

SCREEN ANALYSIS

U.S. No.	S.A.E. Spec.	A	B	C
8	0	0	0	0
10		35.5	54.0	36.0
12	85	60.3	36.2	48.0
14	12	4.2	7.7	14.0
Pan	3	0	1.1	2.0

CHEMICAL ANALYSIS

	A	B	C
T.C.	2.72	3.29	2.42
Si	1.13	1.36	1.20
Ph	.056	.380	.130
Mn	.40	.36	.47
S	.128	.176	.141

Rc HARDNESS

	A	B	C
Low	58	59	57
High	62	65	62
Average	60	63	59

BREAKDOWN TEST

Thru U.S. No. 10 on U.S. No. 12 — No. of Grams Tested—100 — 100 Passes at 7200 R.P.M.

	A	B	C
12	0	0	0
14	2	0	.1
16	4	0	.5
18	4.8	.1	3.5
20	15.6	.2	9.4
25	24.4	7.9	20.7
30	13.5	8.4	12.1
35	9.9	10.6	11.5
40	4.1	11.3	6.0
45	2.7	7.1	4.6
50	2.0	14.2	3.4
Pan	13.7	27.6	17.8
Loss	8.7	12.6	10.4

Remarks — C.M.A. material best by test. *B. M.*

CLEVELAND ABRASIVES

1. Realsteel Shot and Grit 2. Pearlitic Malleable 3. Normalized
4. "A" Iron 5. Hi-Strength "B" 6. Chilled Iron 7. Drawn Steel

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CLEVELAND metal abrasive co.

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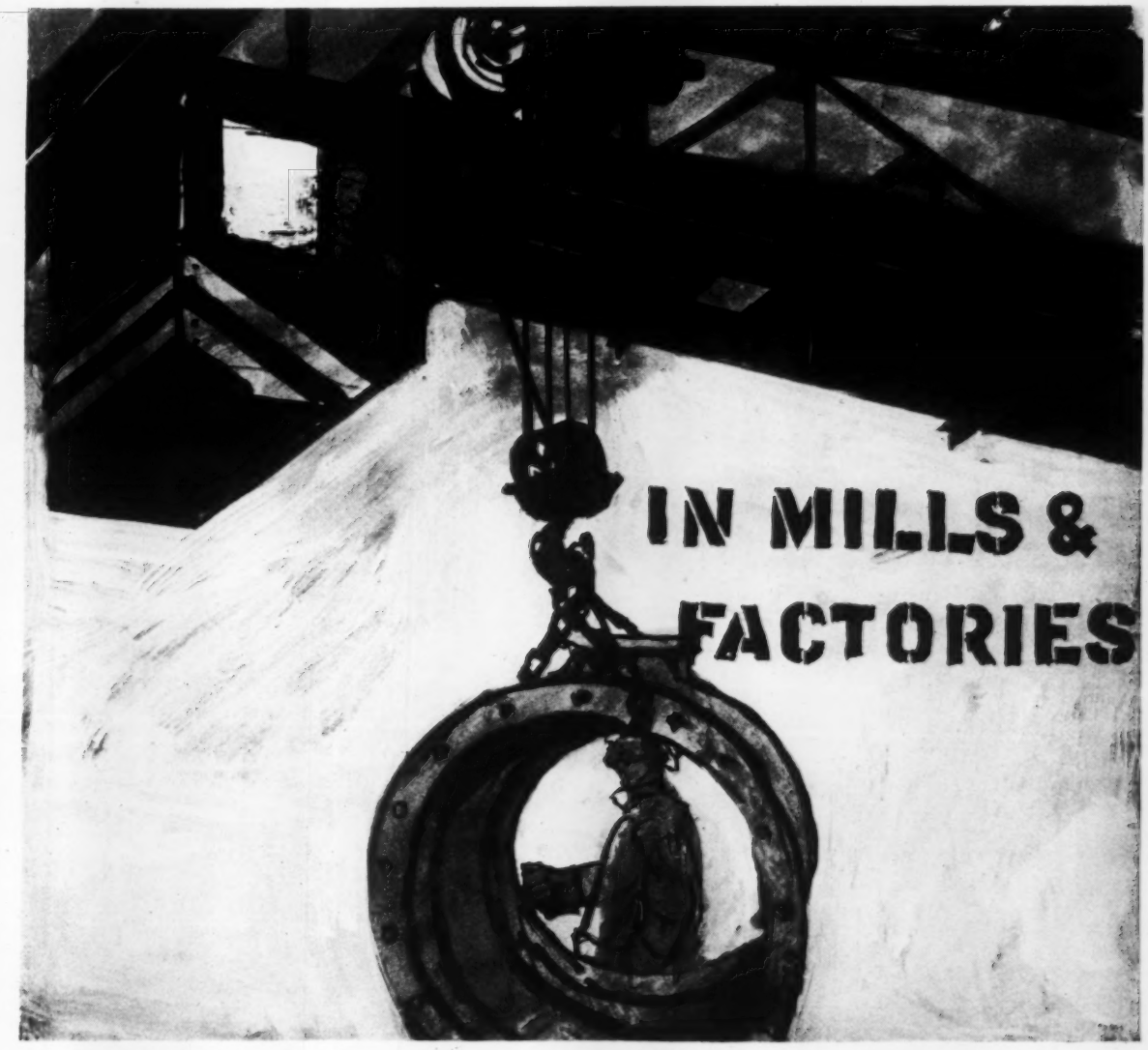
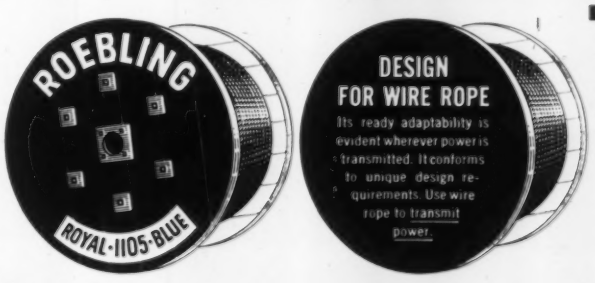


NOW IS THE TIME... stock up on **Roebling Royal Blue Wire Rope**... the dollars you spend today **guarantee tomorrow's profit.** There's never been a tougher, longer-lived wire rope than **Royal Blue.** On that basis alone, you can be sure that every dollar you spend for **Royal Blue** will go further. You will be able to count your profit later. Try **Royal Blue now**—find out for yourself.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ROYAL·1105·BLUE
DESIGN
FOR WIRE ROPE
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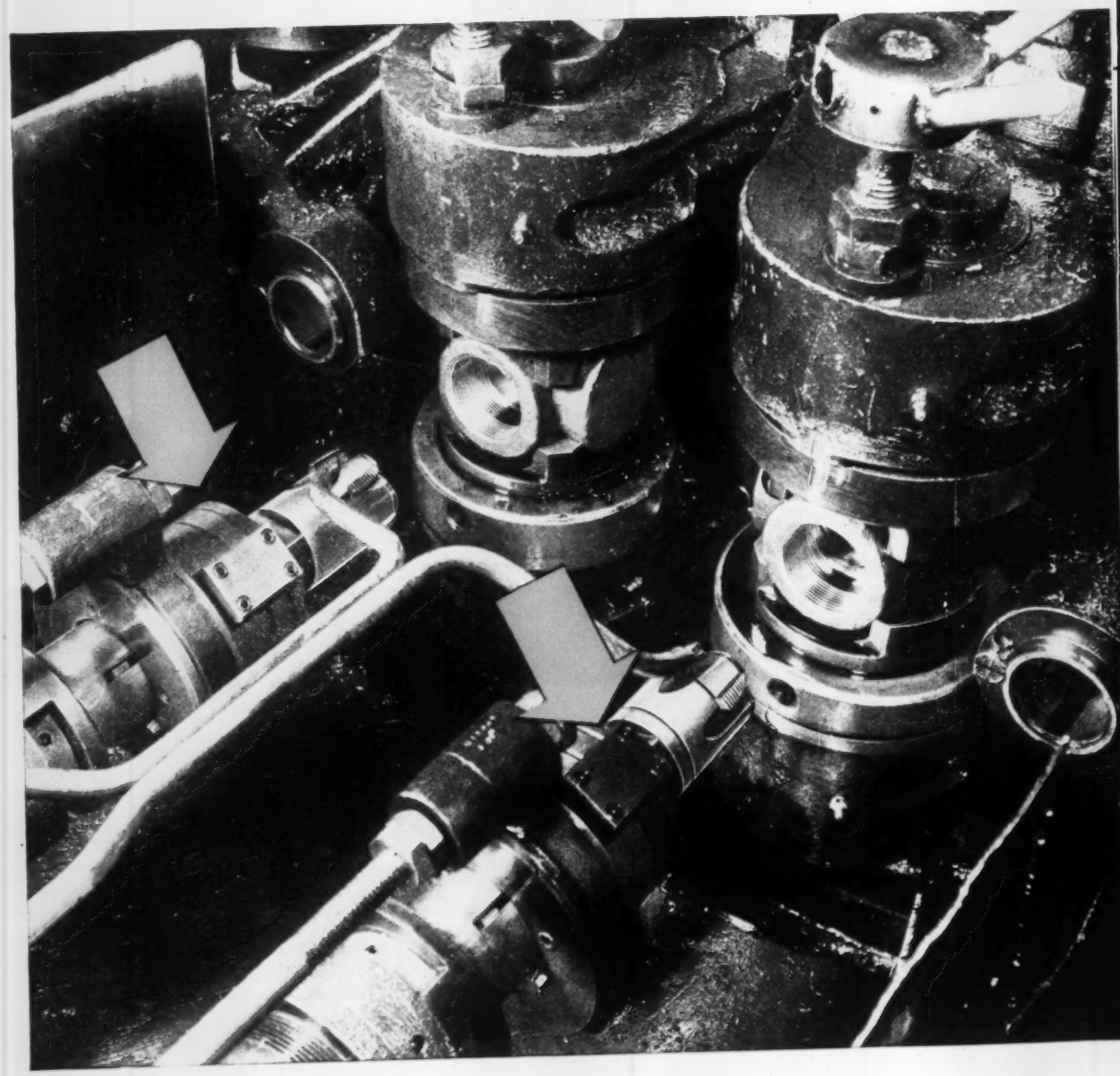
Subsidiary of The Colorado Fuel and Iron Corporation



TAPERED THREADS

produced with LOW Tool Cost by receding TAP

"Receding action" enables the LANDIS LL Tap to thread 4000 W-S pipe fittings per grind at production rates to close tolerances.

This action produces a tapered thread of great accuracy because it mechanically withdraws the chasers from the work at a rate equal to the taper of the thread being produced. Cutting strains are reduced, a true conical thread produced, thread finish improved, and chaser life lengthened.

W-S pipe fittings are produced by the Watson-Stillman Fittings Division of the H. K. Porter Co., Inc. (Roselle, N.J.) for high pressure pipe lines. In the particular operation illustrated, two LANDIS LL Rotary Taps on a special drilling and tapping machine are threading Forged Steel Pipe Elbows. 2" $11\frac{1}{2}$ pitch ASTP threads are tapped at 35 s.f.m.—with 4000 threads completed between chaser grinds.

The LL Tap is also well-suited for threading Stainless Steel. Its cutting action is limited to the throat section or chamfer of the chaser, tapping the thread quickly with little cold-working. As on all LANDIS Taps, detachable heads allow each size of Tap Body to produce a wide range of thread diameters.

For further information, send specifications and ask for Bulletin G-95.

THE WORLD'S LARGEST MANUFACTURER OF THREADING EQUIPMENT - CUTTING - TAPPING - GRINDING - ROLLING

LANDIS Machine COMPANY

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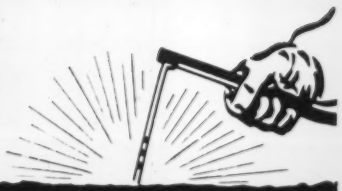

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New Shielded Arc Automatic Welding

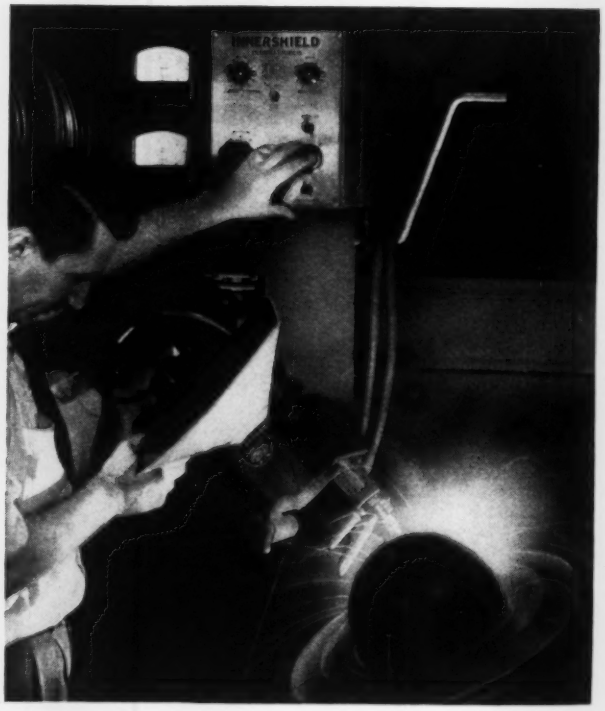
Speeds to 180 ipm!

on 14 gage steel

No Flux or Gas

with

INNERSHIELD



Innershield—an ultra-high speed automatic welding process. No loose flux or gas! Shielding material is in the wire. Produces welds of shielded arc quality consistently at speeds as high as 180 inches per minute. For steels ranging from light gage to ¼″ thick.

If you do high speed, production welding, learn how Innershield will speed up your operation and cut costs. Write for Bulletin 5301.1.

The World's Largest Manufacturer of Arc Welding Equipment

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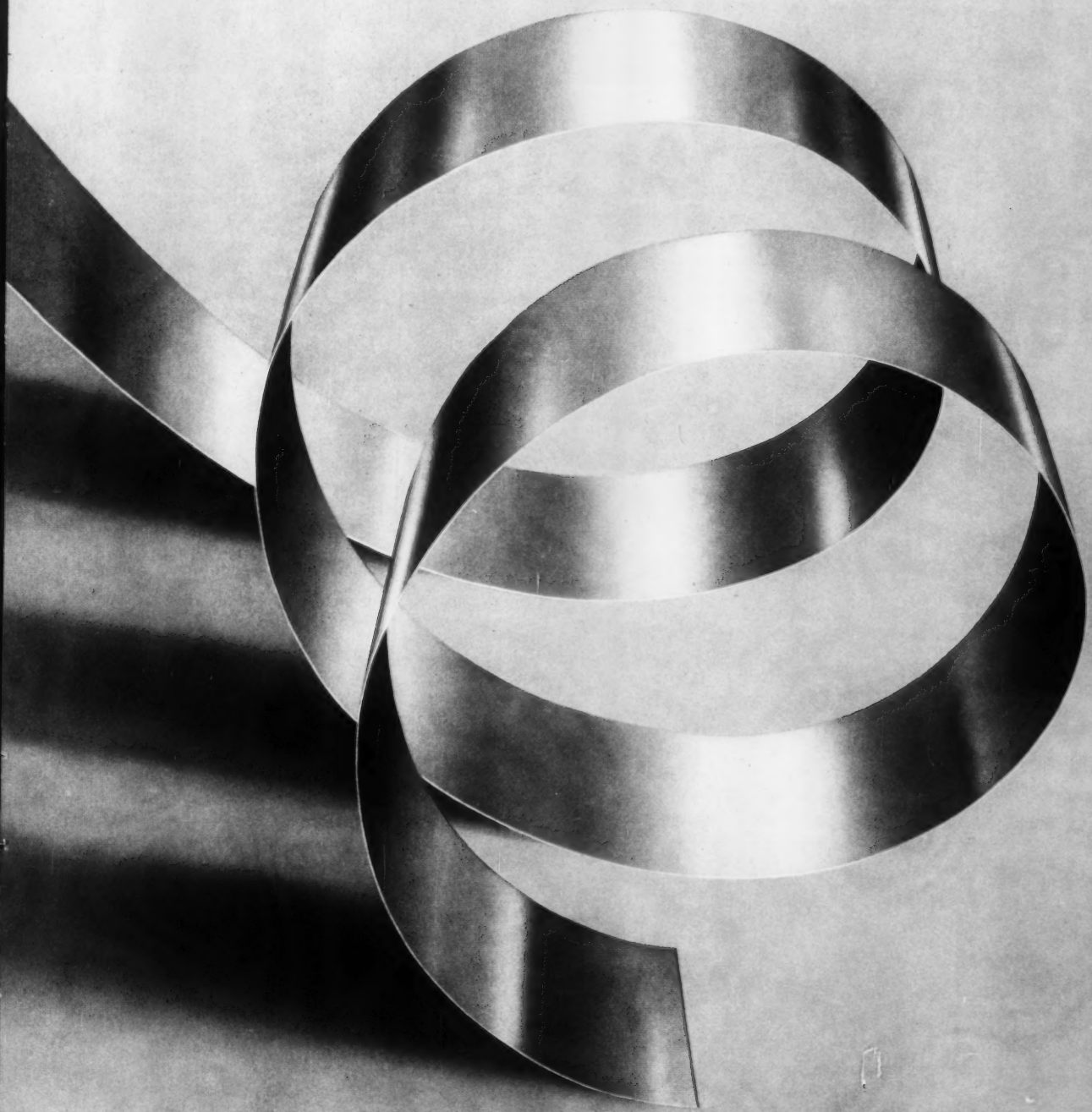
stainless strip — to your specifications

If stainless strip is part of your product, consider using Crucible stainless. Crucible precision-rolls it to your exact specifications — produces finishes that are surpassingly lustrous. And Crucible's painstaking methods ensure uniform metallurgical quality as well as gauge uniformity in coil after coil. Why not obtain these combined qualities next time you need stainless? Crucible stainless is available in all gauges down to .010" and in all widths. Write to *Crucible Steel Company of America, The Oliver Building, Mellon Square, Pittsburgh 22, Pa.*



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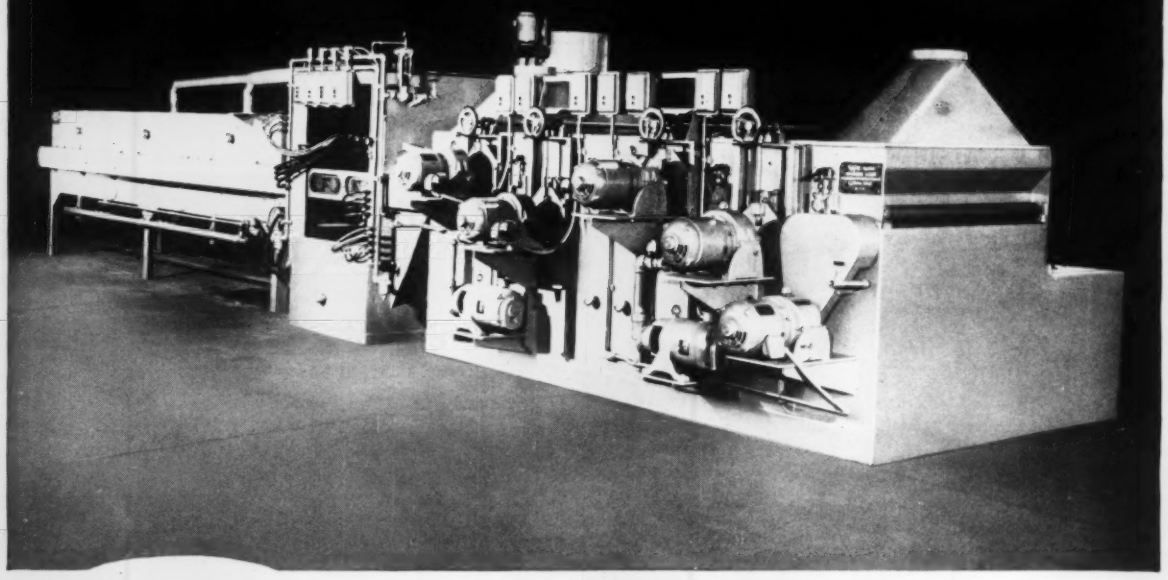
Canadian Distributor — Railway & Power Engineering Corp., Ltd.

New complete service for metal preparation . . .



WHITE-ROTH

machines now available from Pennsalt Chemicals Corp.

White-Roth washers, coaters and dryers have an established reputation for outstanding metal surface preparation in leading appliance, automotive, aircraft and metal processing plants. Pennsalt's chemicals for metal processing provide the most complete line of specialized cleaners, coatings and lubricants in existence.

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Metal Cleaners
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FOSBOND® Phosphate Coatings

A better start for your finish

Pennsalt Chemicals
ESTABLISHED 1850

CALENDAR
OF MEETINGS

Aug. 11-14, Society of Automotive Engineers: National west coast meeting, Ambassador Hotel, Los Angeles. Society's address: 485 Lexington Ave., New York 17, N. Y. Secretary: John A. C. Warner.

Aug. 19-22, American Institute of Electrical Engineers: Pacific general meeting, Hotel Senator, Sacramento, Calif. Institute's address: 33 W. 39th St., New York 18, N. Y. Secretary: N. S. Hibshman.

Aug. 19-22, Western Electronic Show & Convention: Pan-Pacific Auditorium, Los Angeles. Information: WESCON, 1435 S. LaCienega Blvd., Los Angeles 35, Calif.

Sept. 7-12, American Chemical Society: National chemical exposition and conference, International Amphitheatre, Chicago. Society's address: 1155 16th St. N.W., Washington 6, D. C. Executive secretary: Alden H. Emery.

Sept. 8-11, Society of Automotive Engineers: Farm, construction, and industrial machinery meeting, production forum and engineering display, Milwaukee Auditorium, Milwaukee. Society's address: 485 Lexington Ave., New York 17, N. Y. Secretary: John A. C. Warner.

Sept. 10-11, American Die Casting Institute: Annual meeting, Edgewater Beach Hotel, Chicago. Institute's address: 366 Madison Ave., New York 17, N. Y. Secretary: David Laine.

Sept. 11-12, Refractories Institute: Fall meeting, Broadmoor Hotel, Colorado Springs, Colo. Institute's address: 1801 First National Bank Bldg., Pittsburgh 22, Pa. Executive secretary: Avery C. Newton.

Sept. 14-19, Instrument Society of America: Annual instrument-automation conference and exhibit, Convention Hall, Philadelphia. Society's address: 313 Sixth St., Pittsburgh 22, Pa. Executive director: William H. Kushnick.

Sept. 16-18, Electronic Industries Association: Fall meeting, St. Francis Hotel, San Francisco. Association's address: 1721 DeSales St. N.W., Washington 6, D. C. Secretary: James D. Secrest.

Sept. 17-19, National Industrial Conference Board Inc.: General marketing conference, Waldorf-Astoria Hotel, New York. Board's address: 460 Park Ave., New York 22, N. Y. Secretary: Herbert S. Briggs.

Sept. 22-23, Steel Founders' Society of America: Fall meeting, Homestead, Hot Springs, Va. Society's address: 606 Terminal Tower, Cleveland 13, Ohio. Executive vice president: F. Kermit Donaldson.

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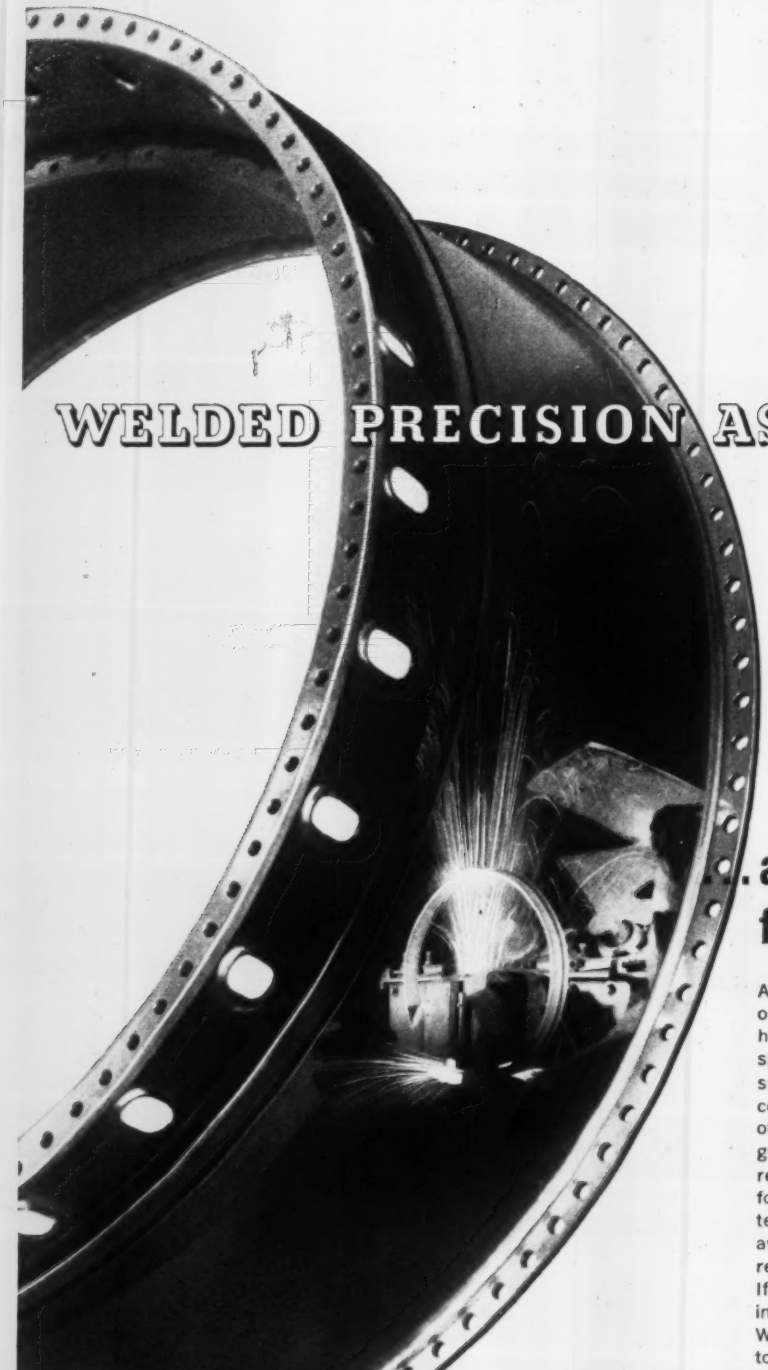

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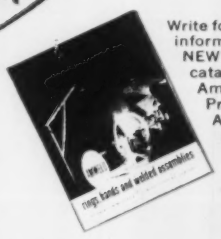

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Metalworking Outlook

Steel Earnings Skid

Here's how the recession is crimping earnings of steel companies (net profits in the first half of '58, vs. the first half of '57): Republic Steel Corp.—$23.9 million, vs. $52.9 million; Inland Steel Co.—$20.1 million, vs. $29.8 million; Youngstown Sheet & Tube Co.—$7.8 million, vs. $21.9 million; Jones & Laughlin Steel Corp.—$5.7 million, vs. $26.6 million; Kaiser Steel Corp.—$4 million, vs. $14.9 million; Allegheny Ludlum Steel Corp.—$1.4 million, vs. $7.7 million; Lone Star Steel Co.—$483,000, vs. $6.7 million. Copperweld Steel Co. showed a loss of $207,000 in the first half, vs. earnings of nearly $2 million in 1957's first half. One of the few companies to do about equally well on profits in the two periods is Continental Steel Corp.: $1,669,754, vs. $1,686,310.

Aluminum Profit Picture

In basic aluminum, Reynolds Metals Co. did better in the first half than in the same period last year: $19.2 million net earnings, vs. $18.5 million. Much of the improvement reflects substantially increased sales to government agencies, although second quarter commercial sales were greater than they were in the first three months. Aluminum Co. of America reports net income of $19.5 million in the first half, vs. $38 million in the corresponding period of 1957.

A Bellwether Industry Starts Rise

Screw machine product orders, shipments, and inquiries were 3 per cent higher in June than in May, the National Screw Machine Products Association reports. Inquiries are close to the 1957 peaks. If they were being translated into orders at last year's rate, the industry's orders would be 25 per cent above what they are now. Even so, orders today are 30 per cent above the low of last December.

Tool Orders, Shipments Drop

Total net new orders for cutting type machine tools in 1958's first six months reached $139.9 million, compared with $316.2 million in 1957's first half and $361.4 million, the first half average for the last decade. First half shipments hit $245.2 million, compared with $492.6 million for January-June, 1957, and $362.1 million, the first half average in the last ten years. Backlogs hold at 2.6 months. June's net new orders for metal forming type machine tools reached $9.1 million, vs. $6.2 million in May. But shipments of $10.1 million were off $2.4 million from May's.

3000 Tools To Be Dumped?

The government program to build up the National Industrial Equipment Reserve in fiscal 1959 by 5000 general purpose machine tools (by transfer from various U. S. agency owners) may be scuttled. A House appropriations

group wants to cut allotments to the program from $3.5 million to $1.5 million. If it does, money will be available to transfer only 2000 surplus tools to the reserve—3000 would have to be sold.

Western Metalworkers Take Note

Western plants with tough forming problems can now try the explosive technique. The first job shop on the West Coast to do that kind of forming work is being operated at Chula Vista, Calif., by Winchester Western Div., Olin Mathieson Chemical Corp. National Northern Div., American Potash & Chemical Corp., will establish one near Las Vegas, Nev. A third shop may also be set up.

Hourly Pay Up More than in 1953-54

Hourly earnings have risen faster in the current recession than in the slump of 1953-54 although the unemployment rate is about half again as large as it was in 1954, points out Sumner Slichter, Harvard economist. Between April, 1957, and April, 1958, hours worked dropped by 5 per cent, but wage and salary income dropped only 1.6 per cent, indicating a 3.6 per cent rise in hourly earnings. In the milder recession, hourly earnings rose only 1.1 per cent.

Harvester Notes

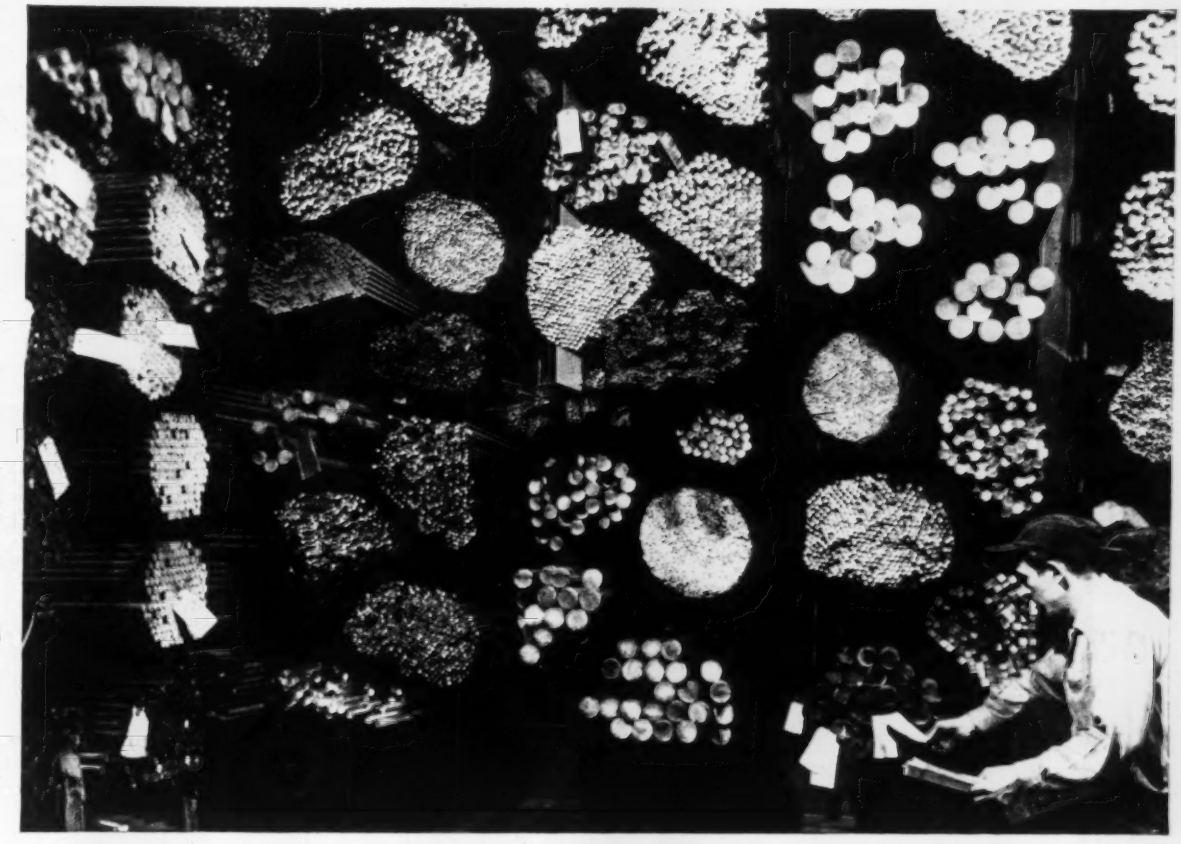
International Harvester Co. is proposing that its present three-year contract with the United Auto Workers, expiring Aug. 1, be replaced with a two-year pact, with the annual improvement factor and cost-of-living escalator clause eliminated. IHC offers its UAW employees a general wage increase of 2½ per cent or 6 cents an hour, whichever is greater . . . The company has spent $22 million in putting into production its new line of farm and commercial wheel tractors, implements, and attachments.

One Cost That Will Drop

Here's one cost that will drop: On Aug. 1 the 3 per cent federal tax and other excises on the transportation of goods will be removed. Those taxes cost shippers $468 million in the 1957 fiscal year. More than half of that was paid by manufacturers; mining companies paid 18 per cent; producers and processors of farm and forest products accounted for the rest.

Straws in the Wind

Ford Motor Co. hints that 1959 models will carry higher price tags . . . Bell Telephone Laboratories officials believe transistors will be used in 90 per cent of all electronic devices by 1975; tubes will go in the remaining 10 per cent . . . Some 6 billion paper clips will be made this year, netting sales of $6 million . . . Studebaker-Packard Corp. officials refuse to confirm rumors that the Packard will be dropped; the final decision won't be announced until October . . . International Nickel Co. has cut its price of nickel oxide in sinter form from 70.25 cents per pound to 69.60, to become competitive with Cuban nickel oxides produced by the U. S. . . . About 5 to 7 per cent of the capacity at Gisholt Machine Co., Madison, Wis., is being used to rebuild machine tools.



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☑ ***Know-How.*** Every day Ryerson steel men—*specialists* in cold finished bars—are in touch with machining problems . . . latest techniques. This unequaled fund of experience is ready to serve you in selecting a steel that gives faster machining to closer tolerances . . . better finish.

☑ ***Reliability.*** Year in and year out your most reliable source for cold finished bars is Ryerson. Call today. Prompt, personal service from experienced steel men proves that Ryerson service saves you time and money on your order for a few bars—or a truckload.

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The PROOF of DSC STEEL is in its PERFORMANCE ON YOUR JOB

THE AP PARTS CORPORATION
TOLEDO 1, OHIO
May 27, 1958
Mr. W. B. Bates, Vice President-Sales
Detroit Steel Corporation
Detroit 9, Michigan
Dear Mr. Bates:
Since 1954, following the completion of your Portsmouth 54" Cold Mill, you have become one of our important suppliers of CR steel coils for our exhaust and tail pipe manufacture.
Over the years, our association has been very satisfactory. Your quality has been consistently good and your service excellent. Your mill people have been most cooperative, and we especially like the attention given to our needs by your Toledo office.
We have enjoyed doing business with the Detroit Steel Corporation and hope our pleasant relationship may continue for many years to come.
Sincerely yours,
THE AP PARTS CORPORATION
P. W. Carnahan
Steel Buyer

DSC *AccuRolled*™ CR SHEET COILS

4 yr.-5 mo. **Job-Performance Record** on AP PARTS Exhaust and Tail Pipes

January '54 through May '58

Score 99.9% Plus

A WORD ABOUT THE AP PARTS CORP. — This long-time customer, with plants in Toledo, Ohio, Grand Haven, Michigan, and Culver City, California, is the world's largest manufacturer of mufflers and exhaust and tail pipes in the automotive replacement field. AP subsidiaries also supply these components to car factories for original equipment.

SOMETHING ABOUT "PIPES" — "Pipes" are everyday automotive necessities . . . an indispensable part of the exhaust system which insures efficient engine performance and motoring safety and pleasure. Thanks to the engineering, production and marketing skills of progressive manufacturers like The AP Parts Corp., "pipes are on tap" at moderate cost at car service centers everywhere.

"Pipes" are actually lengths of electrically welded steel tubing . . . specially sized and bent into complicated shapes to fit cramped clearances between body and frame of individual car makes and models. AP makes over 1,000 different pipes for the cars on the road today . . . plug or ring gauged to five-thousandths tolerance.

THE RECORD — Deliveries: initial shipments, January 1954; beginning March 1954, monthly without interruption. Cumulative weight: thousands of tons. Rejections during these 4 years and 5 months: a single coil in 1955; one in 1956. Here are the job-performance scores year by year:

1954	100.000%	1956	99.828%
1955	99.801%	1957	100.000%

1958 (latest report to 6/1) 100.000%

PART PLAYED BY DSC STEEL — DSC AccuRolled CR SHEET COILS provide the essential combination of uniform gauge and temper and consistent weldability for non-stop roll-forming, welding and shaping operations . . . as in "Pipe" fabrication. Add manufacturing "savvy" like AP's and the stage is set for high-scoring job-performance and low unit production costs . . . another example of customer-supplier teamwork "on the job."

Like to know how we do our part—whatever the DSC product may be? Just write to our G.S.O. or call a DSC Customer "Rep" . . . soon?

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PORTSMOUTH DIVISION, PORTSMOUTH, O.

Coke • Coal Chemicals • Pig Iron
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Manufacturers' Wire • High Carbon Specialty Wire • Aluminum Cable Steel Strand
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MILL DIVISION: DETROIT, MICH., HAMDEN, CONN.

Cold Rolled Carbon Steel Strip
Flat Cold Rolled Carbon Spring Steel

35TH ANNIVERSARY YEAR DSC

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GENERAL SALES OFFICE, DETROIT 9, MICHIGAN

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Charlotte, N. C., Chicago, Cincinnati, Cleveland, Columbus, Ohio., Dayton, Ohio., Detroit, Grand Rapids, Mich., Hamden (New Haven), Conn., Indianapolis, Jackson, Mich., Louisville, Ky., Milwaukee, Wis., New York, St. Louis, Toledo, Worcester, Mass., Winneconne, Wis.

Can We Curb Inflation?

In a major policy statement last week, the Committee for Economic Development (comprising 150 leading American businessmen and educators) cited creeping inflation as our major economic problem.

CED says that long term inflation can be prevented by three major actions:

1. Do everything possible to increase national productivity.
2. Keep demand from rising faster than production.
3. Adopt and adhere to policies that will keep prices and unit labor costs from rising, on the average, when demand is kept from outstripping production.

Its basic recommendation: That the government's objective should be to use its tax, expenditure, monetary, and debt management policies, in combination, to keep the long term growth of demand equal to but not exceed the growth of our country's capacity to produce.

CED also says we must rely on the forces of competition and on the voluntary exercise of restraint in price and wage policies by business and labor to prevent prices from rising when the government succeeds in keeping demand within bounds.

We agree that calling attention to the dangers of inflation is especially appropriate at a time when many business indicators are pointing upward.

But we do not agree that the broad, palliative measures proposed will prove to be much of a defense against inflation.

As we see it, there is no simple solution to this age-old problem.

Government actions to date have upset the economy, not stabilized it.

Prices of many basic materials, including copper, aluminum, and the alloying elements for steel, are affected by world conditions and not solely by what happens at home.

Laboring men will continue to ask for more money as long as they think their employers can afford to pay it.

Strait-jacket controls in a competitive, free economy are unthinkable. They don't even work in a controlled economy.

We think the best defense against inflation is to take the offensive. Find out what factors are likely to affect your business and see what you can do to offset them.

It adds up to finding out what the customer wants, producing it by the most economical methods, and selling it at a price that will net a fair profit.

Irwin H. Such

EDITOR-IN-CHIEF

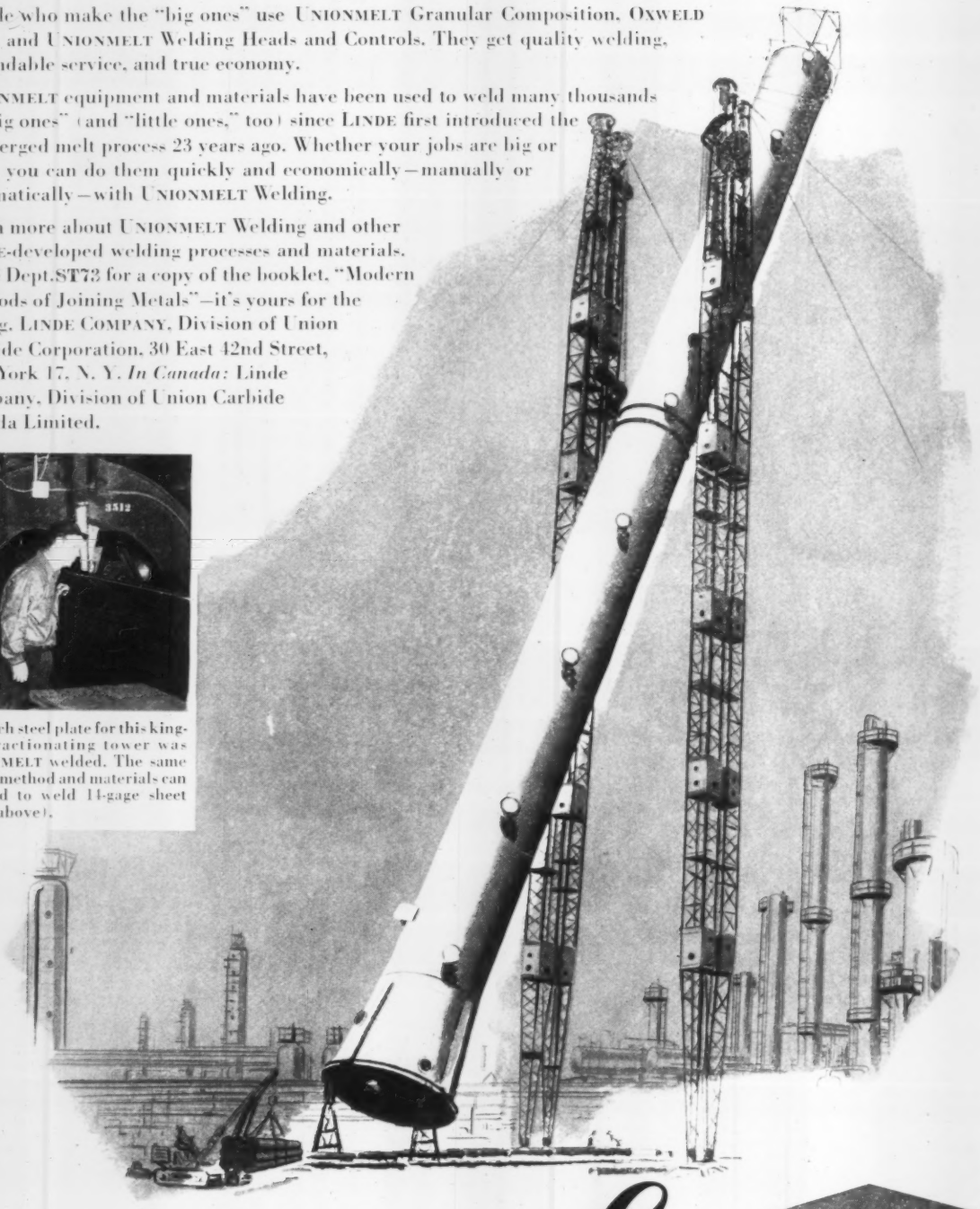
UNIONMELT Welding
makes short work of tall towers

People who make the "big ones" use UNIONMELT Granular Composition, OXWELD Wire, and UNIONMELT Welding Heads and Controls. They get quality welding, dependable service, and true economy.

UNIONMELT equipment and materials have been used to weld many thousands of "big ones" (and "little ones," too) since LINDE first introduced the submerged melt process 23 years ago. Whether your jobs are big or little, you can do them quickly and economically—manually or automatically—with UNIONMELT Welding.

Learn more about UNIONMELT Welding and other LINDE-developed welding processes and materials. Write Dept. ST-72 for a copy of the booklet, "Modern Methods of Joining Metals"—it's yours for the asking. LINDE COMPANY, Division of Union Carbide Corporation, 30 East 42nd Street, New York 17, N. Y. *In Canada:* Linde Company, Division of Union Carbide Canada Limited.

One-inch steel plate for this king-size fractionating tower was UNIONMELT welded. The same LINDE method and materials can be used to weld 14-gage sheet steel (above).



Linde

UNION CARBIDE

The terms "Linde," "Unionmelt," "Oxweld," and "Union Carbide" are registered trade-marks of Union Carbide Corporation.

UAW strike seems less likely as Messrs. Seaton (left) and Bugas make sure . . .

Auto's United Front Still Stands

STRIKE or not, autodom's Big Three have an excellent chance of winning contract extensions with the UAW as long as they can maintain what still appears to be a fairly firm alliance.

But if the trinity breaks down, Walter Reuther will be able to employ his divide and conquer tactics to win demands that the industry believes would force disastrous increases in 1959 car prices.

Stand Firm—That prospect seems enough to keep the coalition together as negotiators move into final innings of this year's parleys after two months of contractless operations. Even if Chrysler Corp. were to go its own way, General Motors Corp. and Ford Motor Co. are so dominant in the industry that their industrial relations vice presidents, L. G. Seaton and John S. Bugas, could still make the two-company solidarity an effective bargaining factor.

Both sides still hope to avoid a shutdown, but the auto companies privately admit they will take a strike no matter when it comes as long as there's a 50-50 chance of winning. So far, Mr. Reuther has not categorically stated the union will strike if the companies fail to change their offers. He has said a strike deadline will be set "when the UAW feels patience should be replaced by action."

First Advantage—It would appear that right now the advantages are on management's side. The UAW has only $37.8 million in its strike fund. It can borrow $10 million from locals, but that might not be enough. The union figures it would cost $41 million to strike GM for seven weeks. At Ford, the cost would be $16.5 million, at Chrysler, $11.3 million.

That adds up to $68.8 million, and one top Big Three negotiator pointedly remarks: "If Reuther calls a strike, he won't know whether it will be against one or against three!"

Second Advantage—The companies still think lack of worker enthusiasm is a strike deterrent. The Michigan Employment Security Commission reports 150,000 autoworkers are laid off—that ratio of unemployed to employed (2 to 5) holds true in the auto industry throughout the country, estimates MESC. The men won't be too eager to face six to eight weeks of strike when they could have full pay checks instead.

Sums up one bargainer: "Only if

the workers think the union is in danger of being destroyed will they strike . . . no matter how much it hurts." Significantly, the UAW chief has not made any strong pitches about the union's future being endangered.

No Strike—So far, Mr. Reuther hasn't found a wedge that will crack the united front, so a strike would probably hurt him more than it would help. It still seems likely that earlier predictions concerning the settlement pattern will be borne out.

Talking to retired workers recently, Mr. Reuther asserted the union would not sign contracts that didn't offer improved pension benefits and protection from inflation. Detroit thinks that play may start negotiations moving toward a close.

Additional small pension benefits (and maybe some SUB) might make the two-year extension more palatable to Mr. Reuther. He can sign without losing face, and the companies apparently can absorb that boost and escalation increases without jacking up car prices.

Once the offer is made, retroactivity appears to be the lever companies will use to force a quick settlement. If the UAW signs quickly, benefits will be made effective at the date the old contract expired. But if the union continues to stall, benefits will start when the new contract is signed.

Employment To Rise

Metalworking executives expect uptrend to continue during third quarter, survey shows

Employment will continue to rise during the third quarter, a national survey conducted by Manpower Inc. of Milwaukee indicates.

Of the rolling mill, steelworks, and foundry respondents, 17.4 per cent expect employment to increase, 66.7 per cent see it remaining the same, and 7.2 per cent foresee a decrease.

In the electrical appliance, fabricated metal, machine, and transportation equipment fields, opinion is divided this way: 13.75 per cent, up, 69.6 per cent, steady, and 8.4 per cent, down.

Building construction is expected to continue as the bellwether during the third quarter. The survey shows 42.3 per cent of construction respondents looking for employment increases while 6.4 per cent see a decline.

The over-all survey, which reflects opinions of 2000 executives in 25 key industries, shows the majority (72.1 per cent) expecting employment to remain at the end-of-June level, 16.9 per cent looking for a rise, and 5.9 per cent anticipating a decrease.

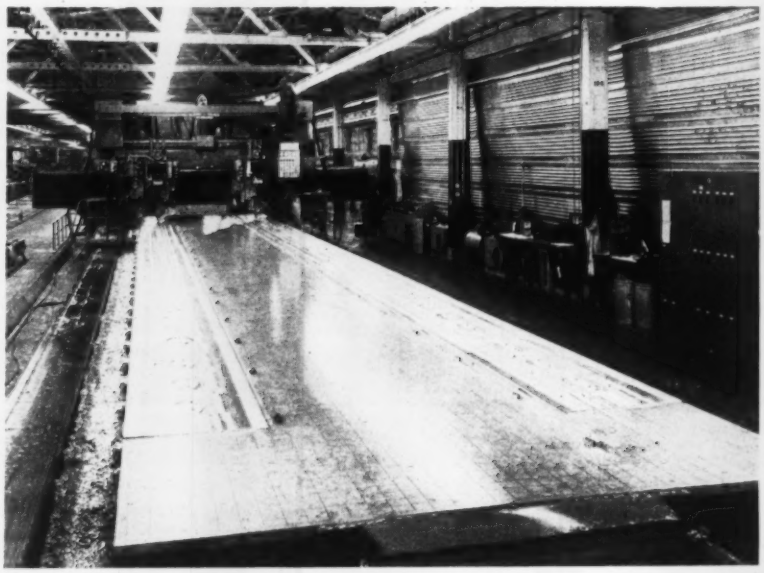
Impressed by Russia

Its plastics industry is competent and growing, reports U. S. team after extensive tour

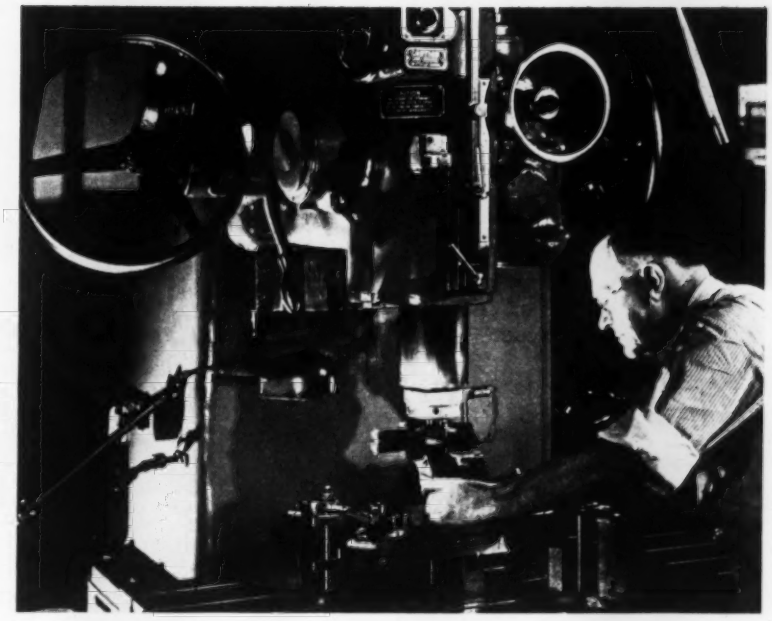
EIGHT executives of U. S. plastics firms traveled 6500 miles inside Russia, visiting plants and research facilities. Their report:

- Where the size and age of Soviet operations are comparable with those of the U. S., technical results are about equal.
- Instrumentation is given considerable attention. (The visitors were also impressed with the quality and intelligence of the personnel working on control boards.)
- Stainless steel equipment is used even where corrosion is unlikely.
- Housekeeping is above average.
- Further expansion of Russian chemical plants may be limited by lack of equipment but not raw materials or manpower.
- Compression molding factories are equipped with batteries of hydraulic presses having rated pressures of 100 to 2000 tons. (The smallest plant visited had 150 presses.)
- Injection molding operations don't measure up to those for compression molding (probably due to emphasis on industrial, not consumer goods, production.)
- Some toolmaking facilities were excellent, judging from the complexity and quality of the finished product.
- The ratio of female employees is high.
- The extent and quality of Russian research impressed the team.
- The visitors were cordially received. (Example: They were offered seats on crowded subways, freely permitted to take pictures.)

Khrushchev Talks — The Soviet government is dissatisfied with progress in some chemical areas. Said Premier Nikita Khrushchev: "There still exists a considerable lag in the field of artificial and synthetic fibers and plastics." He reported that 257 chemical and related plants would be built in the next seven years.



THIS SKIN MILL is producing simultaneously two sculptured wing skin panels for the Boeing B-52G Stratofortress. Built by Kearney & Trecker Corp., West Allis, Wis., the 12 x 80 ft mill is controlled by information on magnetic tape. It is one of several such machines at Boeing Airplane Co.'s Seattle and Wichita plants



Trane Co.

Trends since Jan. 1

- **Costs—4.5%**
- **Hours Worked—** 8.3 hours per week
- **Employment— 2 to 3%**

Volume

- **'58—$850 million**
- **'57—$1.15 billion**

- **Backlogs—16%**
- **Prices—15%**

Diemakers See Uptrend

But rise is expected to be too sluggish to make up for losses in first half dollar volume. Executives see no big programs coming, but expect more business from all fields

THE BELLWETHER tool and die industry is getting up off the floor.

Two-thirds of the respondents in a STEEL survey said good times are coming back—but slowly. Latest figures of the National Tool & Die Manufacturers Association show May orders are 1 per cent over April's, breaking a four-month decline.

Employment Up — Employment figures are also encouraging. The NTDMA reports employment is 2 or 3 per cent better than it was Jan. 1 when unemployment in the industry totaled 25 per cent.

The gain in employment is significant because more than one-third of the firms contacted by STEEL say their average workweek has increased 8.3 hours since Jan. 1.

$850 Million Predicted—Despite the expected upturn, respondents peg this year's volume at about $850 million, which is about 74 per cent of 1957's and 71 per cent of 1956's record $1.2 billion.

Part of the industry's troubles are traced to the switch from aircraft to missiles (a low volume item) in defense emphasis. But shops that can produce short run precision parts are benefiting.

Defense tooling accounts for about 20 per cent of volume, but the percentage should rise as the accelerated spending is translated into hard orders. It should help backlogs which have been dropping. The average of respondents is 4.9 weeks, or 83.5 per cent of their Jan. 1 total.

Price Fighting—Lower profit margins and rugged competition also contribute to the industry's woes. Many hard goods producers have been able to hold their prices and absorb rising costs, but tool shops have had to cut prices to get business. STEEL's survey shows price cuts average 15 per cent, while costs are 4.5 per cent higher than they were in 1957.

The only shops getting by with no haggling seem to be those that have had large companies as customers for a long time.

No respondents report strong foreign competition. Detroit sources estimate foreign tooling at less than 10 per cent—the same figure given in February.

Equipment Buying Down—Half the respondents say they have canceled capital equipment buying plans. The other half, mostly large shops, bought more than planned because of good buys in used machinery.

Nearly all stated that they would buy new equipment if it meant a good order.

More Metal to Venezuela

U. S. metal and metal product exports to Venezuela in 1957 were 131 per cent higher than in 1956, reports Econometric Specialists Inc.

The gain was the highest among major product groups and helped make Venezuela the leading U. S. customer in Latin America.

Steel mill products accounted for $132 million of the $217 million metal export total; manufactures, $77 million.

Blow to Miners

Their chances for solid help fade as House unit drops vital Minerals Bill provision

A HOUSE subcommittee has struck what could be a fatal blow to a meaningful Minerals Stabilization Bill.

Maneuver—The Mines & Mining Subcommittee recommended to the Interior Committee on July 22 that a provision be dropped in the Senate-passed bill which granted borrowing authority to the secretary of the Interior ($350 million over five years). In its place was substituted the normal open ended appropriations language.

The subcommittee members deleted the borrowing authority to make the bill more palatable to the hard core of opposition in the House.

What It Means—Even if the Minerals Bill were to pass the House now (and odds for passage are 2 to 1) it would be meaningless without funds under which it could operate. Financing of the measure would require another bill. The House has used this tactic on unwanted legislation before. At best such an act is subject to appropriation review every year.

Other Provisions — The House also made these changes in the Senate bill: 1. It raised the subsidy payments on lead from 3.9 cents to 4 cents a pound, on zinc from 2.9 cents to 4 cents a pound; 2. It added beryl, metallurgical chromite, and columbium-tantalum to the list of subsidy metals.

Those provisions were evidently a concession to the Senate (a bill to subsidize eight metals is now before the Senate Interior Committee), to soften the blow of killing the borrowing provisions. The remainder of the bill is the same as the Senate version (see STEEL, July 7, p. 118).

Senate Move—Senate leaders are contemplating strategy to get the borrowing provision back into the House bill.

Tariff? — If Congress meets its tentative Aug. 16 adjournment date without helping the domestic mining industry, look for a stepped up effort by the lead and zinc industry to persuade the President to grant the higher import duties recommended by the Tariff Commission. The White House is reviewing its approach to the lead-zinc problem.

NEW GE RADAR ANTENNA plays major role in co-ordinating Nike missile fire at Ft. Meade, Md. Radome enclosed, it is expected to increase range coverage by 52 per cent and cut down the overhead "cone of invisibility"

Aluminum Cans Gain

The metal hurdles a cost barrier in winning new applications in the container industry

ALUMINUM is gaining in its drive for a larger share of the container market. Continental Can Co., New York, will supply several customers with quart-size cans of the light metal for motor oil. Prices will be comparable with tin plate.

Crosses Cost Hurdle—Esso Standard Oil Co. began to sell motor oil in aluminum cans early last spring. To keep prices on a par with tin cans, used cans were collected from service stations. Because of the need for scrap collection, some steelmakers doubted that aluminum could make an appreciable dent in that market. Continental says sales of its cans will be "economically feasible" without any arrangement for recovery of scrap.

Lenvik Ylvisaker, general manager of Continental's research and development department, says that if aluminum were rolled in much greater tonnages and within a narrow range of specifications, its production costs would decrease. He reports this would be possible if a sizable tonnage were used in canmaking. He also thinks aluminum's costs will decrease with the use of lighter gages.

The light metal already is used for producing many products, replacing standard containers other than tin plate. These include tooth paste, facial lotions, and hair sprays. Aim: Win a much larger market held by tin plate.

Next Step: Food Canning—Aluminum hasn't seriously challenged tin plate's dominance in food canning. Its lightness and corrosion resistance are offset by a cost advantage held by the steel product. However, aluminum producers point out that the cost gap is narrowing.

Continental is making test packs of aluminum cans for concentrated citrus juice, Mr. Ylvisaker reports. If these containers can be produced at prices comparable with tin cans, aluminum's challenge to tin plate will mount. At stake is a 5-million-ton market. That's how much tin plate the can industry uses annually.

Russell, Burdsall & Ward Bolt & Nut Co.

Fastener Sales Fall 30%

Earnings decline as automakers, jobbers, and most appliance producers remain out of the market. Upswing may come when auto production increases in fourth quarter

ASK a fastener producer today, "How are your profits?" and he is apt to reply, "What profits?" It may sound overly pessimistic, but it dramatizes fears of many industry members. Their sales are tumbling, pulling earnings down. They see little chance for improvement before the fourth quarter.

Screw sales have declined about 30 per cent in the past year.

Suppliers to automakers report worse sales drops.

Demand for nuts and bolts fell 25 to 30 per cent.

Specialty fastener producers estimate their sales are at least 20 per cent lower than in 1957.

Foreign products are making inroads in eastern markets, manufacturers there say. One blames imports for a 30 per cent decline in wood screw sales.

Profits Suffer — Price weakness adds to producers' worries. Many raised prices a year ago to reflect the mounting cost of steel and labor. Since then, waves of price cutting have knocked quotations down by 10 per cent or more, nullifying the earlier increase and cutting profits.

Says a midwestern producer: "To restore earnings, price increases are needed immediately. We must pass along the complete extra cost of labor incurred early this month as well as any pending increase in steel cost. If we don't, we may be in the red soon."

Price Hike Is Delayed—Despite need for price relief, it's unlikely to materialize before an advance in steel prices. Even if list prices of fasteners were raised now, it's doubtful that anything but a general rise in demand would end price cutting. "Boosting sales of standard and special quality fasteners is our first job," says an eastern manufacturer.

About half the industry members interviewed by STEEL think a sales upswing is on the way—either in the third or fourth quarter. Most of this group believe it will begin in October.

Outlook for Sales Gains—"The second quarter was the low point of this year. A gradual improvement in ordering is already beginning on the part of farm implement and a few appliance producers," says a Cleveland maker of screws and bolts.

"We have noticed a sharp pickup this year in sales to producers of recreational equipment. Outboard motor producers are enjoying a fine year," adds another.

A trend to growing importance

of special fasteners helps take up some of the slack created by falling sales in standard lines. To build up sales volume, more companies are having engineers analyze the need for a fastener, then design one to do the job.

Big Buyers Are Sluggish — Producers admit that these bright spots in sales can't erase slowness among such major buyers as auto producers, makers of household appliances, jobbers, and railroads.

Here's how an Ohio manufacturer sums up such sales: "Automotive buying is virtually nonexistent now, and it will remain low until September. As first '59 models head for showrooms, buying will increase moderately. It won't be strong until November.

"Appliance buying will probably begin to increase in mid-fourth quarter, as automotive orders extend our delivery time. Jobbers slashed their stocks as our deliveries became more current in the first half of this year. They'll have to buy more in the fourth quarter, if the general level of business activity improves."

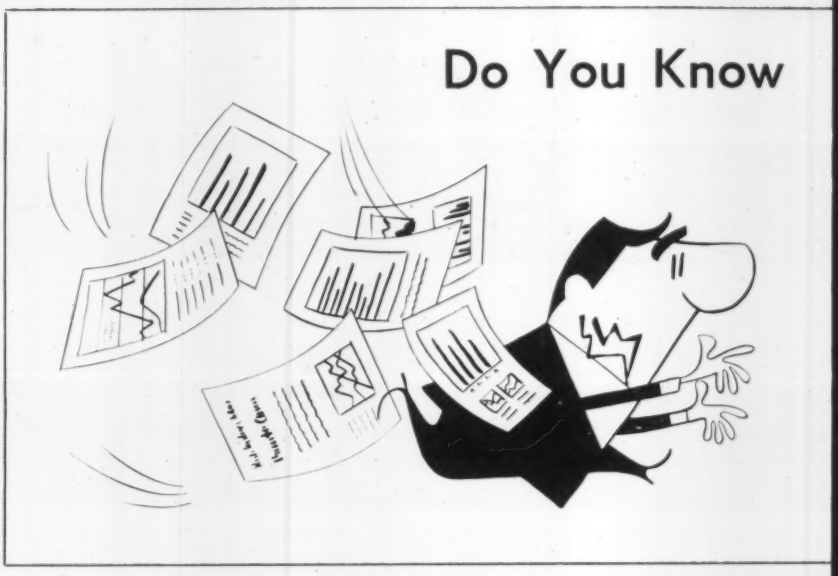
Plans for Building Sales — Sales managers are mapping methods to revive these lagging markets.

"We've developed several products to bolster demand. A new line of construction fasteners is catching on well," say sales executives at Townsend Co., New Brighton, Pa.

"We're increasing our sales force, covering more remote areas, doing more intensive selling, and expanding product lines," comments E. L. Claussen, vice president-sales, Standard Products Div., Chicago Screw Co., Chicago.

These efforts should succeed as general business levels grow, judging by inventory levels. STEEL's quarterly survey shows fastener users have cut stocks steadily since April, 1957. Declines continued through the second quarter of this year. In the latest survey (STEEL, July 7, p. 95), the proportion of those intending to make another slash in inventories was the lowest since January, 1957.

While 18 per cent told STEEL they planned a reduction in the third quarter, 16 per cent said they'd build stocks, and 66 per cent said they intended to keep them stable.



If You Want To Escalate

MANAGEMENT and labor are taking second looks at escalation as it gains as a method of pricing and determining wage increases.

The pay of more than 4.3 million workers is tied in with the consumer price index (CPI). About $180 million in wages is involved for every point of change in it. Untold thousands of metalworking's sales contracts (generally for long leadtime equipment such as generator apparatus) tie the pricing into some indicator, usually a part of the Bureau of Labor Statistics' wholesale price index (WPI).

For the Long Term—Also often escalated are patent royalty and licensing agreements, long leases, utility rates (even alimony settlements). The device is pretty well confined to the long term—and reflects mankind's age-old attempt to anticipate the future.

But thoughtful people are asking: Is escalation a true hedge in this inflationary era? Is it simply a postponement of inflation—a delay that will bring a return of the malady in more virulent form?

For the Short Term—Is escalation effective even in solving immediate inflationary problems? Labor's marriage to the CPI has come to the ridiculous point where some workers cheer when the index rises, an AFL-CIO spokesman admits. Management's use of WPI lessens the pressure for cost cutting, charges one consultant.

Management Problems — A supplier of steel mill equipment tied his price of materials to the metals and manufactures index of the BLS and his charge on labor to the average hourly manufacturing earnings. Both dipped, but his costs climbed. Fallacy: The metals and manufactures index includes scrap and copper. Both nose-dived to pull the index down. In the wage index, the average hours worked dropped sharply to make it fall.

Labor Problems — Even unions have trouble with escalators. A southern Indiana organization lost to another in a representation election. The old union has won escalation tied to the national CPI, but the new group argued that southern Indiana's cost of living was rising more rapidly than the na-

the Answers?

1. Are the unions permanently sold on wage escalation?
2. Where can you learn how to use the CPI (Consumer Price Index) and WPI (Wholesale Price Index) best for your company?
3. How widely are the indexes used by industry? The government?
4. Is the WPI one index or many?
5. Can you have a special index computed for your industry?
6. What is the chief drawback to the WPI?
7. What do you have to watch out for in signing long term labor contracts with escalation clauses?
8. How good is the CPI?

Know Your Indexes

tional average increase.

Another angle about escalators bothers unions anxious for the short term gain: "An escalator tends to freeze our standard of living," worries one labor statistician. "Escalated wage increases should be the jumping off place for further increases, not in any way a limit on wage boosts."

Know Your Index — Managers won't lose much sleep over the possibility of freezing our living standards, but they have a tough one of their own if they wish to hedge for the short term on prices. The difficulty is to pick the right index or the right part of an indicator. For example, a changing buying pattern may be outmoding CPI, although there's nothing unfair or inaccurate about the index itself. Consumers spend more on home ownership, television, and frozen foods than they did when the indicator was last modernized. Ewan Clague, BLS commissioner, notes that "about every 10 or 15 years the index should be basically revised."

He cites these problems which employers face with the CPI: 1. It lags behind over-all economic conditions. 2. Different elements of the index have different seasonal patterns, so the base month of your index is important. 3. While an employer's product may be improved in quality, compensating for a price rise, the employer may in turn be forced to pay his workers higher wages to the extent that his product's higher price influences the higher CPI. 4. Today's CPI hasn't been revised since 1952. 5. A change in the base period (the old one is 1947-49; the new one may be 1957-59 or 1958-60) would affect contracts running into the '60s, so contracts should provide for the change. 6. The use of an improved productivity factor in combination with the CPI is gaining favor.

Special Problem—Unlike the CPI, the WPI is used wholly or in part, depending upon the product for which a sales contract is written. Any drawback to using the WPI is not in the index itself, but rather in the way it is used. As a BLS commodity specialist puts it: "Too many partners to contracts fail to read the letter of their contract; they grab the price chart and run." Although variations in cost of an item don't usually run more than 10 per cent of the total cost when adjusted by the WPI, that is enough to eliminate a manufacturer's profit and more, if he has tied himself to a bad contract.

Like the Census Bureau (STEEL, June 16, p. 58), BLS is not in competition with private research organizations, but it does offer special services to buyers and sellers, as well as advice to CPI users. Where there is a need, BLS will prepare special indexes. If a simple combination of WPI elements will solve your problem, there is often no fee. (A charge may be based on BLS personnel's time used.) The industrial advisers like to bring the parties to a contract together to show them how their index relations will work, but they don't tell them what to do or what not to do. Certainly, advises BLS: "A man must thoroughly understand what is in his index before he can decide what risk is involved in an open-end contract." Again the components of any sample may be suitable, but their weighing could throw off a particular buyer or seller. Specific distribution characteristics are another area of trouble, as are quantity prices, vs. item prices.

The advantage to using the WPI: "Ordinarily, a seller might set his price by guessing at future conditions; the index gives him a more scientific approach," notes one BLS spokesman. When all his profits may lie within that guessing area, it becomes an important decision. A final word: The contract should be specific as to the index's code number and date of publication and where it appears.

Range of Uses—Examples of government escalation: Raw materials bought by the Atomic Energy Commission; strategic and critical materials purchased by the General Services Administration; orders from the Maritime Administration and Defense Department for ship construction and repair; equipment for the Tennessee Valley Authority.

Whoever are the parties to escalation, BLS' advice still holds: If you escalate, know your index.

• *An extra copy of this article is available until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, Ohio.*

The Lebanon Crisis: Its Meaning

PENTAGON sources discount the action in Lebanon as a potential source of business for metalworking. Comments one official: "No extra consumption of hardware is involved." Until something besides oil and gasoline are taken out of the normal supply line, there will be nothing for metalworkers to replace.

Indirectly, the Near East crisis has tremendous significance for STEEL readers. The action comes at a time when space prophets had about taken over the $40 billion plus defense budget. Now the Army and the Marines have current facts to toss at the spacemen, who have preached the death of the lowly infantryman for so long. The action is a phenomenal piece of luck for the Strategic Army Corps (STRAC), the recently organized paper force designed for quick action in local emergencies.

The $45-billion budget expected for fiscal 1960 will have more dollars in it for conventional war armament than first planned. Because circumstances will hardly allow the administration to reduce expenditures for space projects, the extra money for conventional stuff will be a net gain to metalworking.

More Minuteman Contracts To Come

Despite indications to the contrary, the Air Force's first contract awards for its versatile, solid-fueled Minuteman have gone to companies with plenty of experience: Avco for the nose cone; North American for guidance; Thiokol, Hercules Powder, and Aerojet General for propulsion. Small contracts went to Beech Aircraft, Thompson Products, and Bendix Aviation.

One important area still to be contracted for: Assembly and final testing. The multibillion dollar program (the "ultimate" in missile design and perhaps the last step before "space wars" become possible) will start slowly with development contracts. Metalworking "production" in the true sense will come when the bird is operational—probably by 1963-64.

A Pentagon source reports 15 to 20 firms will bid on the assembly contract: He believes that to be somewhat of a departure from the weapons system approach to missile contracting because no one firm will act as a prime contractor. Assembly contracts will be let about Sept. 1

Fiscal '58 Budget Results

"Both receipts and expenditures for fiscal 1958 were less than estimated last January," reports the Treasury Department. Instead of the originally planned deficit of $400 million, Uncle Sam went into the red by $2.8 billion: Receipts were $1.1 billion below those of fiscal 1957's; expenditures jumped $2.5 billion.

The force of the recession is revealed by the drop in receipts from the January estimate. Individual tax income was off $2.2 billion; corporate taxes, over $250 million; excise taxes, about $375 million.

Defense spending ran $39.7 billion, compared with $39.1 billion in fiscal 1957.

How Much Help for Small Business?

House-passed legislation to give small firms $260 million in tax relief is "illusory," charges Rep. Thomas Curtis (R., Mo.). It is "big business' idea of what is good for small business," he contends.

Mr. Curtis promises to push for a better bill next year which will help the 85 per cent of small firms not operating as corporations (two sections of the bill apply to corporations) and provide a better deal on estate taxes to avoid the merger trend. He feels the bill generally applies to small manufacturing firms, not service companies, and offers little help to new firms.

Biggest point of the bill for metalworking is the permission to write off 20 per cent of the cost of machinery and equipment in the year it is bought.

Space Agency Is Agreed Upon

The National Aeronautics & Space Administration has been approved by both houses of Congress to run that part of our space program which the Defense Department doesn't control. (A liaison committee will deal with jurisdictional quarrels between the Pentagon and NASA.)

The patent question has been resolved this way, says Sen. Lyndon Johnson (D., Tex.): NASA can retain or grant to private persons, as it sees fit, all or any portion of the patent right growing out of the agency's activities.

Mobilization Producers' List Ready

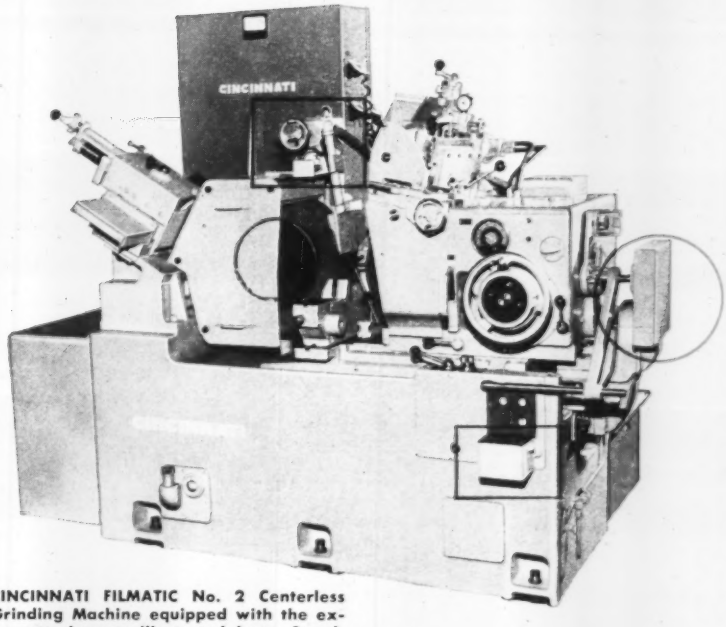
If you want to know what plants will be producing for the Defense Department in case of an emergency, write to the Government Printing Office, Washington 25, D. C., for a copy of "Register of Planned Mobilization Producers" ($1). The register lists 18,000 plants.

Capitol Notes

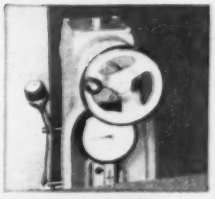
More low cost homes are being built, says the Federal Housing Administration . . . Sen. Charles Potter (R., Mich.) is pushing the State Department into stopping the proposed tolls on interlake traffic through the Welland Canal . . . Sen. James Murray (D., Mont.) predicts statehood for Hawaii early next year.

LOOK WHAT'S NEW

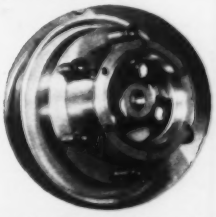
in Low-Cost Centerless Grinding



CINCINNATI FILMATIC No. 2 Centerless Grinding Machine equipped with the extra attachments illustrated here. Standard machine catalog No. G-644-4.

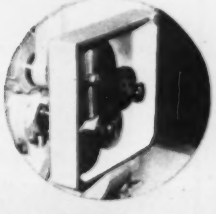


New Spindle End Adjustment Unit with dial indicator. For quick, accurate axial adjustment of grinding wheel spindle, when setting up for infeed grinding operations. ⅜" total adjustment available.



Automatic Grinding Wheel Balancing . . . an exclusive feature. Freely rotating steel balls automatically balance the wheel mount when unclamped. Perfect balance is attained in a few seconds. Ask for demonstration.

New Precision Indicator Attachment for taper correction. Provides a visual check on the amount of regulating wheel unit swivel adjustment, measured in increments of .000010" per inch. Top of unit shown here.



New Vari-Pitch Unit for hand infeed grinding. A simple change gear arrangement gives the operator a choice of three throat openings for maximum safety and convenience in loading infeed work.

. . . New Types of Equipment now available for CINCINNATI FILMATIC Nos. 2 and 3

In addition to the many advantages offered by the new CINCINNATI Centerless Attachments and extra equipment illustrated here, the machine itself will give you far superior performance because of FILMATIC grinding wheel spindle bearings . . . anti-friction infeed slide . . . infinitely variable regulating wheel speeds . . . quality controlled castings. Cincinnati is tops for your replacement program; for producing your new products; for engineering service. Preliminary information in Sweet's Machine Tool File.

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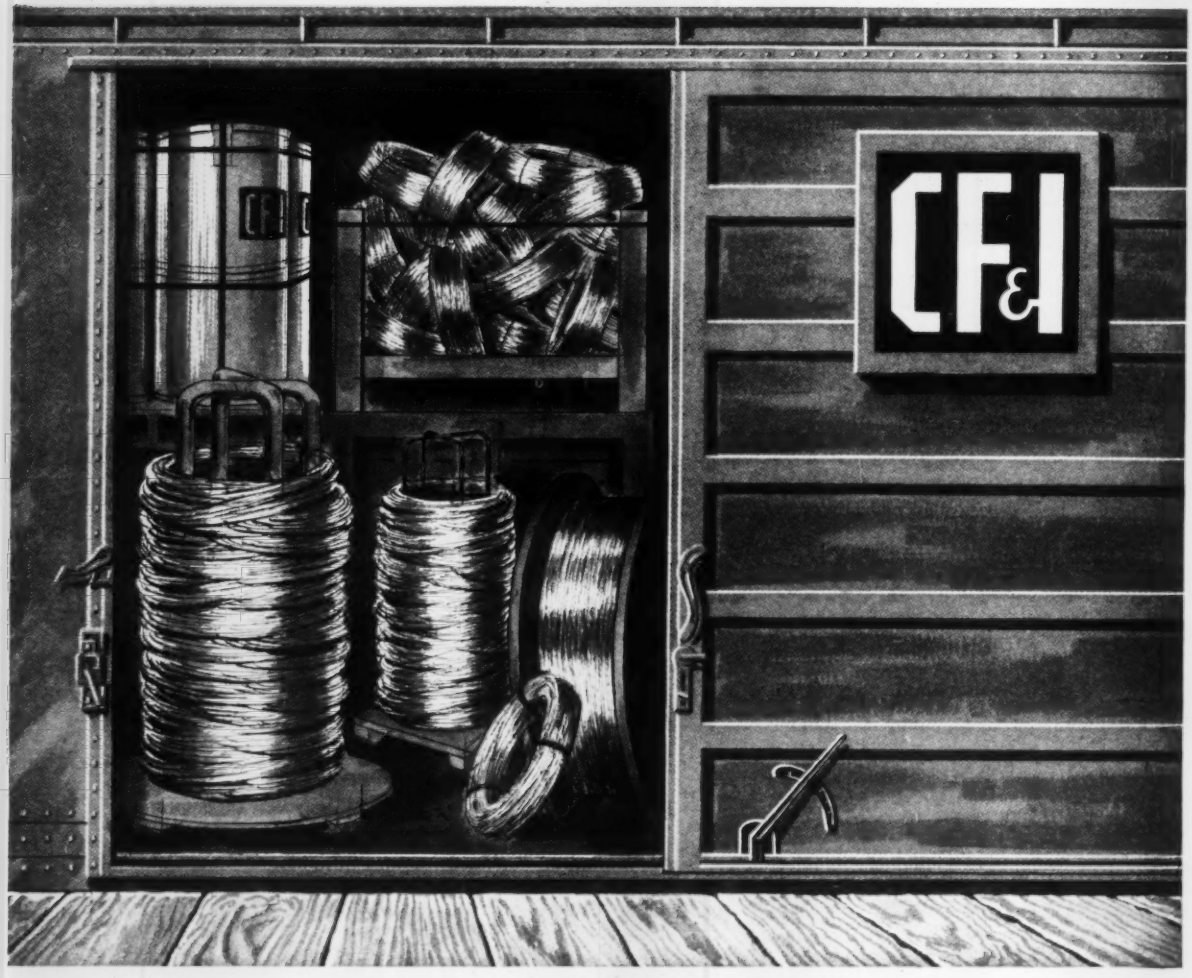

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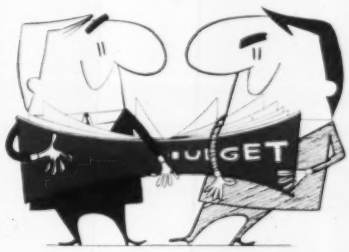

Extending Budget Responsibility

1. Gives every manager direct participation
2. Makes managers better planners by forcing them to think ahead and be prepared for changing conditions
3. Provides top management an effective yardstick for determining what effect business changes will have on the over-all company
4. Pinpoints accountability, permitting quicker detection of costs drifting out of line
5. Develops a better atmosphere for giving credit for good work and for impersonalizing criticism
6. Sets up a good control mechanism for decentralized operations
7. Discourages "empire builders" and promotes "management team" concept

Inland Controls Finances

PINPOINT BUDGET responsibility with managers at all levels and you'll get better financial control.

That's the goal of a program being set up by Inland Steel Co., Chicago. It's aimed at personalizing the budget for all managers from general foremen up.

"Most executives agree," says Walter Bunge, manager of budgets, "that it's relatively easy to judge and improve budget efficiency during level business operations. Changing cycles create havoc. This approach will help us keep closer tabs on costs during such periods."

What It's for—Inland's program has three basic objectives, namely: 1. To increase budget consciousness among its managers. 2. To facilitate identification and corrective action on costs that are drifting out of line. 3. To provide top management with guides for decision making.

Market research and sales departments develop sales forecasts by product line. From them, managers develop budgets—based on current operations—for each specific area of responsibility. They are co-ordinated and approved by top management.

The budget represents Inland's sales-expense target. To make it a more useful tool, each manager also develops expense account groupings for three levels of business operations: 1. On target sales. 2. Sales down 33 per cent. 3. Sales up 33 per cent.

Using budget work sheets, a formula is developed based on the two extremes. The formula is the testing device for the budget and can be applied to any level of operations.

Planners and Problems—"In preparing the budget sheets, the manager really becomes a budget planner," Mr. Bunge points out. "He's faced with these types of problems during business changes:

"In a sales upturn, do you hire more people or work your personnel overtime? In the first situation, training costs may be involved; in the second, premium costs for overtime must be considered.

"In a downturn, you might have the problem of crane crews. At one level of operations, one crane might not be adequate, but two cranes might be too many. One solution might be to co-operate with another department facing a similar problem so that a crane crew can be shared half-time by each."

Why It's Good—One basic value of this approach is that it necessitates planning for changes—often co-operating with other departments. A manager commits himself on future action.

Each manager gets a monthly expense report. "This is his report card on how he's doing," explains Mr. Bunge. "For the company overall, it's a much more effective way to measure sales and costs than a comparison with a previous year's figures. Both the manager and his superiors can spot costs getting out of line and take action to correct them."

In setting up the budgets, Inland tries to keep them realistic. Cost cutting is a continuous responsibility of each manager. "Psychologically, it's better to give a manager a realistic budget and a challenge to improve it, than to set the budget too low and require him to live within it," believes Mr. Bunge.

Word of Caution — One major problem in setting up this type budget program is tailoring your accounting system to support it. Product costs are not enough. Accounting procedures must be arranged to accommodate the organizational chart so that individual accountability can be established.

There are many advantages (see checklist) to personalizing the budget for your managers, emphasizes Mr. Bunge. "Perhaps the greatest is that it requires a manager to plan and commit himself on how he'll operate under a given set of circumstances. It also provides a much needed bridge between the art of management and the technique of accounting."

A cough or sneeze could spoil an entire day's work at Miniature Precision Bearings

Miniaturization: When Is It Needed and

A PREWAR destroyer used 350 electronic components. The 1958 model has 350,000. It would sink were it not for miniaturization.

Miniaturization, a relatively new concept, is fashionable—"the thing to do." But it's talked about far oftener than it's done. Most of the initial fieldwork, particularly in electronics, was paid for by the U. S. government. (It has been too expensive for many firms.)

What It Is—The word miniaturization has been given many meanings. Difficulty in definition stems from the fact that it is somewhat faddish with the result that many firms stretch the word thin in claiming that they're miniaturizing. It has been described as "more and more from less and less," and understood in terms of making things not necessarily smaller but lighter or more powerful.

For the most part, true miniaturization is the process of making a product or component smaller. It was born of necessity (the destroyer) and has become increasingly more essential. Example: Whenever 1 lb of instrument weight is added to a missile or an airplane, it must be supported with about 16 lb of additional weight to obtain sufficient thrust and velocity to overcome the first extra pound.

Commercial products, such as transistor radios or television sets, are miniaturized to increase efficiency and to facilitate repair—and to gain another selling point. (Customers often think small items are "cute.")

Most industrialists point to these reasons for miniaturizing products or components: To reduce weight; to save valuable space; to increase portability, or to reduce the number of parts needed and thereby cut costs.

What Products—A steel firm executive observes: "I can't see much future for miniaturization in strictly mechanical operations. There just isn't any reason for it."

In all probability, he's right. Miniaturization appears to have an unlimited future, but chiefly in the electronic and related industries. Its greatest applications are in missiles, aircraft, computers, television, and medical equipment. Picture-thin television screens have already been developed in the laboratories, but it will be some time before they will be produced commercially.

Be Careful of

Design—Smallness is one facet only. Leave designers alone.

Materials—Be sure you have sources for needed new ones.

Labor—Miniaturization requires highly skilled workers.

Tools—Your present machinery probably isn't adequate.

Costs—Can you afford the initial drain on the company pocketbook?

Reasons—Be sure your product will be improved.

What Is It?

What It Costs—Miniaturization can be profitable if (and that's a big word) the process is necessary in a given application and the firm is willing and able to pay the initial price.

Don't be misled by the glamour. The costs of miniaturizing are high both in money and headaches. Actual cash differences in production costs of miniaturized and conventional products are nearly impossible to come by, but every company contacted by STEEL agrees that the smaller products cost "considerably more." A spokesman for Lockheed Aircraft Corp., Sunnyvale, Calif., says his firm expects this trend to continue "at least until they enter the mass production stage." And that won't happen soon.

One comparison: A bearing manufacturer which produces tiny bearings (ordinarily for the military, probably for missiles) makes 90 per cent of its products from vacuum melted steel which reportedly boosts bearing life by as much as 620 per cent. For this steel, the firm pays $5.67 a pound (cold-rolled steel is 24 cents a pound). Result: Precision ball bearings, available in conventional sizes for pennies, can cost as much as $2 to $5 in miniaturized form.

A 29-cent potentiometer can jump in price to about $6.50 in the 0.25 in. diameter version.

But dollars are only part of the price to be paid for entering the field. Other problems include getting the right designs, equipment, and workmen for the job. Quality control also takes on new aspects: Micrometers may not provide sufficient checks on accuracy. One firm uses instruments capable of measuring accurately to a quarter-millionth of an inch.

And So?—The sobering costs lead to one conclusion: The process of making a product substantially smaller is long, involved, expensive, and not always successful. It should be undertaken only when a definite improvement in the product can be seen.

And when that criterion is used, the talk comes around again to electronics: Example: A World War II radio pack set (as most veterans remember only too well) weighed 40 lb. By the time of the Korean War, weight had dropped to 29 lb and size was down from 0.6 cu ft to 0.28 cu ft. By 1960, Radio Corp. of America (working under government contract) expects to cut it to 15 lb and 0.14 cu ft. Sometime between then and 1965, RCA wants to introduce a micromodule version weighing 5 lb and measuring only 0.01 cu ft.

During the Korean War, an Army radio relay multiplexer (it allows several messages to be sent simultaneously) weighed 1200 lb, took up 28.19 cu ft of space. By 1960, RCA will have developed a 65-lb unit one-fourteenth the size of its predecessor; by 1965, the firm expects to have it down to 3 lb and 0.07 cu. ft.

American Bosch Arma Corp. has miniaturized a computer component (for addition and subtraction) to a volume of less than 2.15 cu in. (smaller than a cigarette pack). It's used in Arma's airborne digital computer and is about one-fourth the size of the component it replaces, which in turn is only one-fortieth the size of functionally comparable units used five years ago.

Where We Are—Miniaturization then is a product of the electronic age and has grown mostly through government prodding. But the concept is seeping into industry at an increasing pace. Proof: Miniature Precision Bearings Inc., Keene, N. H., sponsors an annual Miniaturization Award Program. In the firm's first contest last year, 54 companies submitted entries. Products ranged from a miniaturized electronic subassembly to a small, portable electrocardiograph.

Contest categories were: Microminiature subassemblies, capacitors, miniaturized tracking controls, subminiature timing devices, potentiometers, respiratory animometers, and servomotors.

Instrument Sales Soar

Laboratory and industrial instrument sales are rising an average of 15 per cent annually. The industry will continue to grow faster than the American economy, believes the Business & Defense Services Administration, Washington.

Producers think sales in the second half will mount to $1.5 billion, compared with $1.3 billion in the first half. The gain contrasts with a decline in expenditures for plant and equipment. Instrument sales are also influenced by outlays for research and development, the government's aircraft and missile programs, and developments in electronics.

Baltimore Cuts Taxes

Baltimore passed an ordinance exempting new industries from local taxes, effective July 1. It also exempts tools and machinery in expansions.

City taxes on tools, productive equipment, and inventories had been levied on industry in 1957.

The community's economy suffered as a result of that policy, so an ordinance reducing the taxes on industry by 25 per cent each year over a four-year period was passed in April, which adds up to complete exemption by Jan. 1, 1962.

letters from production men . . .

Thread grinders serve as research tools

The versatility of Jones & Lamson Thread Grinders is hardly tested in the conventional production of hobs, taps, gages and threaded parts. In our toolroom, using the thread grinder as a basis for "Rube Goldberg" development we have produced precision racks, small form-profiled milling cutters, oil grooves and grinding wheel crushers.

While serving the purpose as a necessary piece of equipment, it also provides a platform from which solution-seeking thoughts may be launched in determining many additional production problems. The application of the thread grinder to toolroom problems is putting the best foot forward in achieving quick, accurate and dependable shop accessories.

— Production Specialist —

One machine replaces three

Our Jones & Lamson #5 turret lathe equipped with tracing attachment is doing the work formerly done by three conventional turret lathes. This Jones & Lamson machine does the rough and finish bore on a 6.5 diameter, 10.0 long magnesium ring. There are nine bore diameters, eight shoulder dimensions, all held to close tolerances. The accurate repetition and smooth operation of this machine reduces operator strain and produces better parts.

In our operation, full utilization of machine tools is a must. We appreciate our Jones & Lamson in helping to attain these goals.

— Assistant Superintendent —

Not afraid of competition

When the bids and quotations are opened, it's the shop with the J&L tools that gets the business. J & L turret lathes are the backbone of our job shop. Over 80% of our work is composed of machining the various alloys of stainless steel. J&L's speed, feed, power and rigidity coupled with your rapid traverse makes it possible for us to undertake jobs that our competitors wouldn't think of attempting, unless they too have J & L tools.

The availability of a J & L factory trained representative is an intangible asset to us. There isn't another machine tool builder in our area that has this service so readily available. Time and again his courtesy calls, at no expense to us, have resulted in the solving of production problems.

— Owner —

Accuracy is a "must"

We have used Jones & Lamson equipment for 17 years. In the past six months I have been partly responsible for replacing some of the turret lathes. One feature that makes Jones & Lamson our choice is the versatility possible with the 5" chuck opening.

Our principal reason for choosing Jones & Lamson again is that its rigidity and accuracy can be thoroughly depended upon for internal and external boring. The satisfaction of knowing that the close tolerances required *will* be held is vastly important in the production of our aircraft parts, because it cuts to the minimum the spoilage and rejection of parts and manhour costs.

With our future program of jet aircraft and missiles, these factors are even more important than formerly. Close tolerances and the fitting of mated parts are an absolute necessity, and we feel sure that Jones & Lamson machines will give us quality and quantity of parts to meet our requirements.

— General Foreman —

Straight from the shoulder

I am a man that came up the longest and most interesting way. Apprentice, turret lathe operator, toolmaker, Sub Foreman, Turret Lathe Foreman, Gen. Foreman, Gen. Supt. and I think I know what I am talking about. I will tell you guys in plain shop language, the best damn feature of one of the finest turret lathes built, — now hold your breath. This is it. The J&L Preselector.

Features:

#1 The best design. Past, Present, and Future. You were right the first time. No design change.

#2 Ease of training apprentices and future supt's.

#3 Safe to operate. No broken backs or torn shop coats.

#4 Less motion than any other design. Means no wear, no maintenance, no down-time. Hours x man's time + burden = Dollars saved.

#5 No personnel problems, as long as you let them operate the machine with the simple preselector.

P.S. We have saved 35% with our new #5 tracer.

— General Superintendent —

The lady has a point

When we order Jones & Lamson machinery, my desk is never cluttered with unnecessary paper work. The precision, durability, and dependability of your equipment keep repairs and breakdowns to a minimum, thus saving precious time and tedious work.

Jones & Lamson machinery is help we can rely on with confidence.

— Production Secretary —

A few words from Texas

Texas is predominantly an agricultural state, and as such, raises farmers and ranchers rather than mechanics. However, it is rapidly becoming an industrial state. But — and here is the catch — farmers and ranchers are not very good machine operators.

Short runs predominate in our industry, and short runs call for turret lathes. The Jones & Lamson Hydraulic Tracing Attachment can make turret lathe operators out of farmers and ranchers in a very short time.

— Procurement Engineer —

No strain — no pain

The advanced progress in cutting tools has created a challenge to the machine tool industry. One of your answers is a heavier headstock, a heavily ribbed bed, and a rigid universal bridge carriage (supported on front and rear bed ways).

For instance: — Our new #9A-4½ J & L Saddle Type Turret Lathe performs a normally twenty minute operation in three minutes. Steel forgings (twenty inches in diameter) have one-half inch of stock removed from *both* O.D. and I.D. with a .015 feed and a spindle speed of 489 RPM. There is no sign of vibration under the strain nor does the machine falter.

"Rigidity" built into Jones & Lamson's equipment to permit a heavy cut at high speed is my answer to increased production.

— Mechanical Engineer —

Tough job made easy

The operation was rough turning cylinder barrels on a Fay automatic lathe.

This machine had 2 sets of tool blocks with 2" square tool bits, one set feeding into the cut from the front and one set feeding into the cut from the rear. The material was Chrome Molybdenum steel, hot forged. We removed as much as 100 pounds of metal from this forging in less than five minutes. The cuts were 2" wide and about ¼" thick. It was a high production job, as there are twelve of these cylinder barrels to a motor. When the chips cooled, due to the heat generated in removal, they were a deep blue color. This was as tough a job as I have witnessed. This machine demonstrated the design and quality of Jones & Lamson lathes.

— Machine Buyer —

(names of these customers available on request)

. . . to Jones & Lamson Machine Company

517 CLINTON ST., SPRINGFIELD, VT.

Willys' small car, the Ace, is scheduled for a reappearance as . . .

Willys Plans Small Car Revival in Brazil

Boom in Latin America prompts Ohio Jeep producer to make passenger cars there. Production will begin in 1960. Target is 20,000 per year in 1961

WILLYS MOTORS INC., Toledo, Ohio, is taking another fling into the small car field, this time in Brazil. The company's independent affiliate, Willys-Overland do Brasil, is tooling up to build the 1955 Willys passenger car in that country. Some of the equipment will be bought here.

S. A. Girard, Willys vice president and general manager, says production will start in 1960 and will aim for 20,000 units annually by the end of 1961. Willys indicates the car will cost about what it did when it was discontinued here in 1955 (suggested list was $1648). The announcement kills rumors that the old Willys body dies were to be sold to Chrysler Corp. for that firm's small car program.

Opportunity — Mr. Girard points out that Willys is venturing into this market because of the rapidly expanding economy of Latin American countries. He hints that in time the car may be exported to other countries—possibly even to the U. S.

Brazil has a population of 61 million. The Commerce Department estimates its annual net income is around 884 billion cruzeiros (current exchange rate is $7.20 per 1000). Its industrial production accounts for more than 20 per cent of total income and is growing at a better than 3 per cent annual rate.

At last count, the Automobile Manufacturers Association claimed Brazil had 631,272 vehicle registrations. Some 306,000 are passenger cars. That's one car for every 203 persons, vs. one for every three persons in this country.

Most of the cars are imported, although the Commerce Department reveals that six manufacturers, including Chevrolet and Ford, have applied for licenses to build trucks in Brazil. (The operations will amount to a $200-million investment). The Commerce Department indicates Willys will be the only quantity-produced passenger car.

The Deal—Under the terms of the agreement, Willys Motors Inc. will contribute $6.5 million worth of dies, tooling, equipment, and manufacturing knowhow to Willys-Overland in exchange for stock. Capitalization comes through stock issues to Brazilian citizens and from a $3.5-million investment loan from three international finance groups, says Mr. Girard. The expansion program will represent a $22-million investment. Willys-Overland's capitalized worth in 1956 was listed at $4.2 million.

Currently, Willys-Overland is manufacturing Jeep utility vehicles, including station wagons, at a rate

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of 12,000 a year. It expects to increase this production to 40,000 in 1960. Under Brazilian licensing laws, 95 per cent of the Jeeps and cars (by weight) must be manufactured in Brazil by 1960. About 45 per cent of the Jeep components still are being imported, but the Brazilian firm is expanding its manufacturing facilities.

Expansion—Willys-Overland's engine line will produce the Willys F head, 6 cylinder engine which can be used for trucks and passenger cars. The line has been making Jeep engines since February and is being expanded to 180,000 sq ft. Its foundry, in operation since January, is being enlarged to produce over 100,000 blocks, heads, and other castings annually. Willys Motors Inc. also has purchased the press equipment of Jarecki Corp., Grand Rapids, Mich. This equipment is being shipped to Brazil and will be set up later this year.

The company will buy U. S. equipment to set up an axle and manual transmission plant which will begin operating in July, 1959. Assembly facilities will make use of present Jeep lines, plus many of the passenger car assembly tools and fixtures that have been in storage since the Willys was discontinued.

History — Willys flopped sadly when it introduced its small cars in this country in 1950. The cars never made it in a market that was emphasizing the longer, lower look and the horsepower race. The company has since concentrated on Jeep production and building its export markets.

The Willys that's slated for Brazil is expected to be the 1955 Ace series in a four-door hardtop style. Wheelbase is 108 in. and over-all length is 180 in. The car is 59 in. high, 72 in. wide, and weighs 2778 lb.

The powerplant will be the F-head six, turning out 115 hp at 3650 rpm. It has 226.2 cu in. displacement and a 7.3:1 compression ratio. The car will have a manual transmission.

AMC Pays Off Loans

American Motors Corp. reports it has paid off the last of its bank loans and shows a net profit of more than $5 million for its third quarter, ended June 30. A year ago, the company had $33.7 million of outstanding debts.

President George Romney says that by mid-July AMC had built 156,785 Ramblers and sold 117,943 of them, compared with production of 82,977 and sales of 69,310 in the previous year. He figures the company will sell 150,000 cars by the end of its fiscal year (Sept. 30). AMC needs 120,000 unit sales to break even.

On the basis of anticipated earnings, the company should show close to a $15 million net profit for the year. Mr. Romney says the firm will shut down for three weeks (starting Aug. 4) for model changeover. Production of 1959 Ramblers will begin at a 4150 weekly rate.

U. S. Auto Output

Passenger Only

	1958	1957
January	489,357	642,090
February	392,112	571,098
March	357,049	578,826
April	316,503	549,239
May	349,474	531,365
June	337,355	500,271
6 Mo. Total	2,240,850	3,372,889
July		495,629
August		524,354
September		284,265
October		327,362
November		578,601
December		534,714
Total		6,117,814

Week Ended	1958	1957
June 21	84,396	118,805
June 28	92,277	125,909
July 5	35,273	73,682
July 12	73,062	111,943
July 19	84,966†	117,205
July 26	80,000*	119,857

Source: *Ward's Automotive Reports.* †Preliminary. *Estimated by STEEL.

Station Wagon Sales Grow

Retail sales of Chrysler Corp. station wagons have increased 16.4 per cent over last year's and are accounting for more than 21 per cent of the company's passenger car sales.

Byron J. Nichols, group vice president, automotive sales, says the four door, three seat model with an observation seat facing the rear has been the most popular. The model was introduced in Chrysler lines in 1957. For the first eight months of this year's model run, sales are 154 per cent ahead of last year's.

C-W To Build Diesels

Mercedes-Benz diesel engines are expected to be built in this country by 1960, indicates reports from Curtiss-Wright Corp.'s Utica-Bend subsidiary which will produce the engines under a crosslicensing agreement with M-B. The engines will be built in the Utica, Mich., plant which the C-W subsidiary has leased from Studebaker-Packard Corp.

Currently, the 30 to 200 hp diesels are being imported from Germany by Utica Bend and adapted for marine, industrial, and automotive use. Engine blocks will continue to be imported from Germany until full tooling can be built up.

Exhaust Notes

- Ford reportedly has released orders for a 6 cylinder, small car engine to its Engine & Foundry group. It supposedly has a cast iron block and will be rated at 125 hp with a 144 cu in. displacement. Initial production is slated at 40 per day. The engine will be placed in the front of the car.
- Chrysler Corp. won't be outdone. Its top management has given the go ahead to a small car group which is supposed to rush through a design. So far, the group has come up with a design proposal for a 6-cylinder engine with a diecast aluminum block. Chrysler still hasn't made a decision to build a small car here. At best, it will be a full year behind General Motors and Ford in development.
- There's talk that Ford's T-Bird may sport an anodized aluminum roof by 1960, but sources close to the company say this report is unjustified . . . the Thunderbird may have an aluminum overlay on its roof for that year.
- Total car sales in the 1955-65 period will reach 68 million, prognosticates Frederick E. May, University of Michigan's School of Business Administration. He bases his projection on a continuing 3 per cent annual increase in consumer income and the upcoming population growth of the 1960s.

Bob showed them a new product that ended rust on work and tools—

STANDARD Special Transparent Coolant

A case story about the Adams Company, Dubuque, Iowa

Before Standard Oil lubrication specialist Bob Wenger told The Adams Company management about Standard's SPECIAL TRANSPARENT COOLANT, there had been considerable trouble with rusting of work and machines in the plant. There had also been trouble with deposits on the ways of the grinding machines. Rust occurring on parts being processed was resulting in damage and even losses. This has been changed.

"Since we changed to your SPECIAL TRANSPARENT COOLANT, we have not had any rusting or deposits on our machine tools, and this product has eliminated the rusting problem on parts being processed through our plant," says Harlow Adams, president of the company.

The Adams Company found they received important additional benefits as well. Operators could now see their work clearly. There was less wheel loading. Because the coolant didn't foam, more of it stayed on the wheel resulting in cooler operation. Faster cuts were obtained with finer wheels. Finer wheels gave better finishes. Periods between dressings were extended. Tolerances were maintained.

Research, development and more than two years of field testing have gone into Standard's SPECIAL TRANSPARENT COOLANT. This is the pay-out to you on the research done by Standard Oil to bring you better metalworking products. Find out more about Standard's SPECIAL TRANSPARENT COOLANT. Call your nearby Standard Oil lubrication specialist in any of the 15 Midwest or Rocky Mountain states. Or write **Standard Oil Company, 910 South Michigan Avenue, Chicago 80, Illinois.**

Quick facts about
Special Transparent Coolant

- Clear, transparent fluid.
- Able to control corrosion and rust on work and machines.
- All chemical. Does not support bacteria growth.
- Unaffected by humidity.
- Nonfoaming.
- Fire resistant.
- Odorless.

No rust. Shaft ground with Standard's SPECIAL TRANSPARENT COOLANT shows no rust on inspection by A.T. Murphy, General Superintendent, Harlow Adams, President, and Bob Wenger, Standard Oil lubrication specialist.

You expect more from STANDARD *and get it!*

WHERE SCHOOL IS NEVER OUT!

Group of CSS sales representatives get briefing on operation of one of Republic Steel Corporation's 66" Skin Pass Mills.

To do a Better Job for CSS Customers, the Men at The HOUSE OF STAINLESS are Constantly "Studying" to Keep Pace With the Latest Advancements

Behind the flexible service at The House of Stainless is a thorough knowledge of stainless steel that distinguishes this source of supply.

This know-how doesn't come from experience alone. It comes from our frequent mill visits for first-hand schooling on latest advancements in production. From the close relationship with our many sources of supply. From close, personal contact with stainless steel users in virtually every field.

When you combine this working knowledge with an unusual flexibility of supply, you can see why it pays to do business with The House of Stainless. We carry the most complete stainless steel stocks. Where it's a special item, our people know the capabilities of all our mill sources, so we can get you *exactly* what you need—*at no extra cost to you.*

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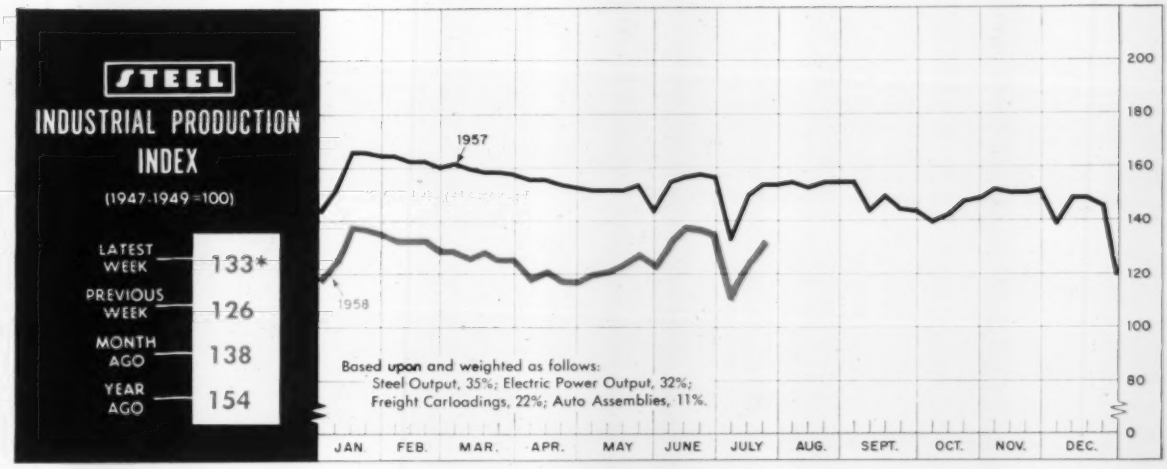


*Week ended July 19.

Consumers Show Signs of More Spending

THE CONSUMER is beginning to open his pocketbook again, and it may mean that he will duplicate his 1954 performance as a recession buster.

Of all the segments of the economy, the consumer has been the least affected by the recession which is almost a year old. Despite record unemployment, he has kept on spending about as he did in 1956 and 1957. During the week ended July 12, department stores did 5 per cent more business than they did in the corresponding 1957 week. To date, cumulative sales are only 2 per cent behind those of the similar year-ago period. While most of the recent gains are in nondurable goods, the demand for durables, especially fans and air conditioners, has shown strength this month.

More Money — A steady rise in personal income since the low point was reached in February is partly responsible for the uptrend in spending. At a seasonally adjusted annual rate of $351.8 billion, the June figure was the highest for 1958 and exceeded the annual rate of 1957 by almost $4 billion. The big factor in the nearly $2-billion rise over May's total was the stepup in wage and salary payments, although they are still below the 1957 rate. All other segments of income are above last year's level.

Higher wages reflect the improvement last month in both employment and hours. Production workers in manufacturing plants worked an average of 39.2 hours a week and earned a gross wage of $83.10 a week. Both figures are up considerably from the May figures.

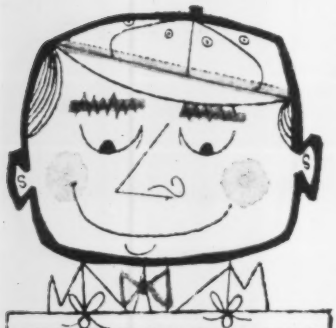
Cash dividends are maintaining their 1957 rate. Despite decreased corporate earnings, dividends in June came to $1.7 billion, virtually the same as they were in the 1957 period.

Right Combination — Personal savings have declined a bit from the record level of last year's first quarter, but they are still high enough to be a significant factor in spend-

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Production (1000 net tons)[2]	1,540[1]	1,481	2,033
Electric Power Distributed (million kw-hr)	12,100[1]	11,851	12,306
Bituminous Coal Output (1000 tons)	1,330[1]	1,240	7,456
Crude Oil Production (daily avg—1000 bbl)	6,500[1]	6,439	6,880
Construction Volume (*ENR*—millions)	$733.0	$559.0	$386.4
Auto, Truck Output, U. S., Canada (*Ward's*)	109,033[1]	96,855	148,550
TRADE			
Freight Carloadings (1000 cars)	575[1]	491	743
Business Failures (Dun & Bradstreet)	275	292	256
Currency in Circulation (millions)[3]	$31,375	$31,384	$31,183
Dept. Store Sales (changes from year ago)[3]	+5%	+1%	+5%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$23,657	$18,815	$22,317
Federal Gross Debt (billions)	$275.6	$276.0	$272.8
Bond Volume, NYSE (millions)	$27.5	$23.8	$19.2
Stocks Sales, NYSE (thousands of shares)	15,415	12,510	11,122
Loans and Investments (billions)[4]	$94.5	$95.3	$87.6
U. S. Govt. Obligations Held (billions)[4]	$32.3	$32.6	$26.0
PRICES			
STEEL's Finished Steel Price Index[5]	239.15	239.15	239.15
STEEL's Nonferrous Metal Price Index[6]	198.7	195.9	216.4
All Commodities[7]	119.2	119.3	118.0
Commodities Other than Farm & Foods[7]	125.7	125.5	125.4

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1958, 2,699,173; 1957, 2,559,490. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-39=100. [6]1936-39=100. [7]Bureau of Labor Statistics Index, 1947-49=100.



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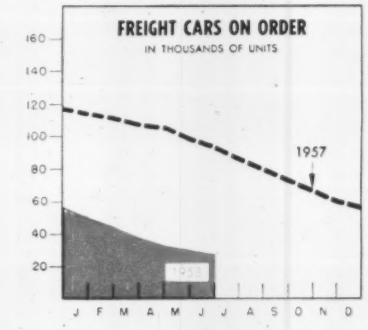
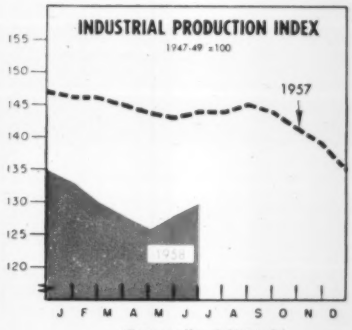
THE BUSINESS TREND





	Awards		Backlogs (end of month)	
	1958	1957	1958	1957
Jan.	401	5,328	48,787	114,656
Feb.	294	6,065	43,750	111,965
Mar.	239	5,359	38,027	107,708
Apr.	278	6,429	32,908	105,190
May	1,372	3,423	30,386	97,006
June	317	4,918	27,757	91,810
July	....	1,251	.....	85,229
Aug.	....	3,203	.....	79,258
Sept.	....	3,257	.....	71,981
Oct.	....	2,206	.....	65,718
Nov.	....	1,070	.....	59,194
Dec.	....	3,492	.....	55,941
Total	....	42,051		

American Railway Car Institute.
Charts copyright, 1958, STEEL.

(Seasonally Adjusted)

	Total Production		Primary Metals		Metal Fabricating	
	1958	1957	1958	1957	1958	1957
Jan.	133	146	100	143	159	180
Feb.	130	146	95	143	153	180
Mar.	128	145	91	137	150	179
Apr.	126	144	86	134	146	176
May	128	143	91	132	148	176
June	130*	145	99*	132	151*	179
July	...	144	...	133	...	177
Aug.	...	145	...	136	...	177
Sept.	...	144	...	131	...	174
Oct.	...	141	...	128	...	168
Nov.	...	139	...	121	...	170
Dec.	...	135	...	107	...	163
Avg	...	143	...	132	...	175

Federal Reserve Board. *Preliminary.

ing plans. During the first quarter of this year, they totaled $4.1 billion, well above the total for the preceding quarter. With these sources of cash and softening credit, the consumer is in a good position to do something about the recession.

But the most recent survey of consumer attitudes and inclinations to buy (conducted by the University of Michigan) casts some doubt on the matter. The survey indicates there has been no further deterioration of consumers' attitudes since late in 1957, but there is no real sign of improvement during the rest of 1958.

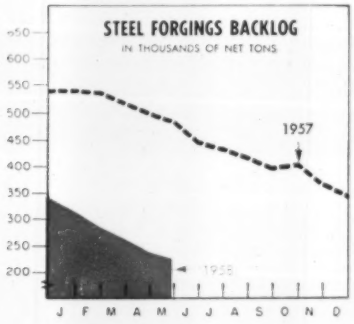
Basic Need Intact—The basic desire or need for durable goods, homes, and additions or repairs to homes is almost as great as it was a few years ago. But purchases are still being deferred until general business conditions snap out of it. Business is expected to be better this time next year—this and the anticipation of lower prices could momentarily shake loose some purchasing power.

But intention to buy durable goods is less now than it was six months ago, although there was considerably more hedging in this regard than in the November-December survey. There are indications that the auto market is favored by a slight improvement in buying intentions.

Construction Zooms Up

The Michigan study revealed that consumers think that now is a better time to buy homes than it was six months ago—this is reflected not only in housing starts, which reached an annual rate of 1,090,000 in June (the best level since August, 1956), but also in applications for GI home loans. Last month, they were more than 68 per cent over the May total.

Construction in general is marking up one of the steepest uptrends in contract awards in its history. Heavy construction awards in the week ended July 17 boomed to $733 million, the highest figure since mid-1952 when atomic energy plants swelled the total, declares *Engineering News-Record*. For the year to date, contract volume is 7 per cent greater than it was in the 1957 period. Only five weeks earlier, 1958 was still behind the 1957 pace. The biggest element in the climb has been a record volume of federal, state, and local government construction awards.



	Shipments 1958	Shipments 1957	Unfilled Orders 1958	Unfilled Orders 1957
Jan.	108	148	318	537
Feb.	93	135	288	533
Mar.	92	146	266	517
Apr.	83	139	242	497
May	79	135	229	479
June	128			445
July	104			431
Aug.	115			417
Sept.	117			397
Oct.	126			401
Nov.	105			365
Dec.	99			343

U. S. Bureau of the Census. Data based on reports from commercial and captive forge shops with monthly shipments of 50 tons or more.

	1958	1957	1956	1955
Jan.	93.07	126.34	122.43	97.00
Feb.	93.49	139.29	129.56	98.71
Mar.	97.89	140.76	166.14	149.16
Apr.	122.36	132.67	145.20	109.52
May	118.04	157.95	155.53	110.50
June		121.57	189.13	139.00
July		128.31	165.50	111.76
Aug.		110.09	168.70	106.20
Sept.		116.79	130.35	136.80
Oct.		124.80	143.38	123.52
Nov.		87.80	138.50	118.09
Dec.		105.65	117.76	139.85
Avg		124.34	147.68	120.01

Material Handling Institute Inc.

Index Gains Again

STEEL's industrial production index continued to regain its preholiday strength as it climbed to a preliminary 133 (1947-49=100) for the week ended July 19. All four elements making up the index posted gains, one of the few times this has happened this year. Continued improvement can be expected for the following week. Only auto production should drop, but it will be offset by slight gains in steel and electricity output and a significant rise in freight carloadings.

Carloadings have been depressed abnormally by the coal miners' holiday. Coal production was off about 85 per cent in the first two weeks of July. Normally, coal loadings account for more than 100,000 cars a week. Now that mining has resumed, several points will be added to the index. Once that strength has been restored, the decline in auto production for model changeover will be the dominant force. It will result in lower readings until output of '59s is in full swing.

RR Car Backlogs Slide

Railroad equipment backlogs continue to dwindle as shipments far outrun new orders. Deliveries of new freight cars during June totaled 2407, down from May's 3534. But new orders dropped sharply to 317 units. The backlog slid to 27,757 units. (See chart and table, Page 52.)

Class I railroads took delivery of 311 new locomotive units in the first half of 1958, vs. 735 in the comparable period of 1957. The big drop came in the second quarter, which accounted for only 74 of the deliveries. The backlog now stands at 134 units, vs. 462 a year ago.

Trends Fore and Aft

• The government's wholesale price index declined again in June, sliding to 119.1 from the May figure of 119.5 (1947-49=100) for all commodities. The index for all commodities other than farm and food remained at 125.3 for the second month, but indications so far in July are that it will move up a notch this month, possibly to 125.4.

• Business incorporations in June totaled 11,991, topping both the previous month and the year-ago period, reports Dun & Bradstreet Inc. At the same time, failures declined 6 per cent to a five-month low of 1260.

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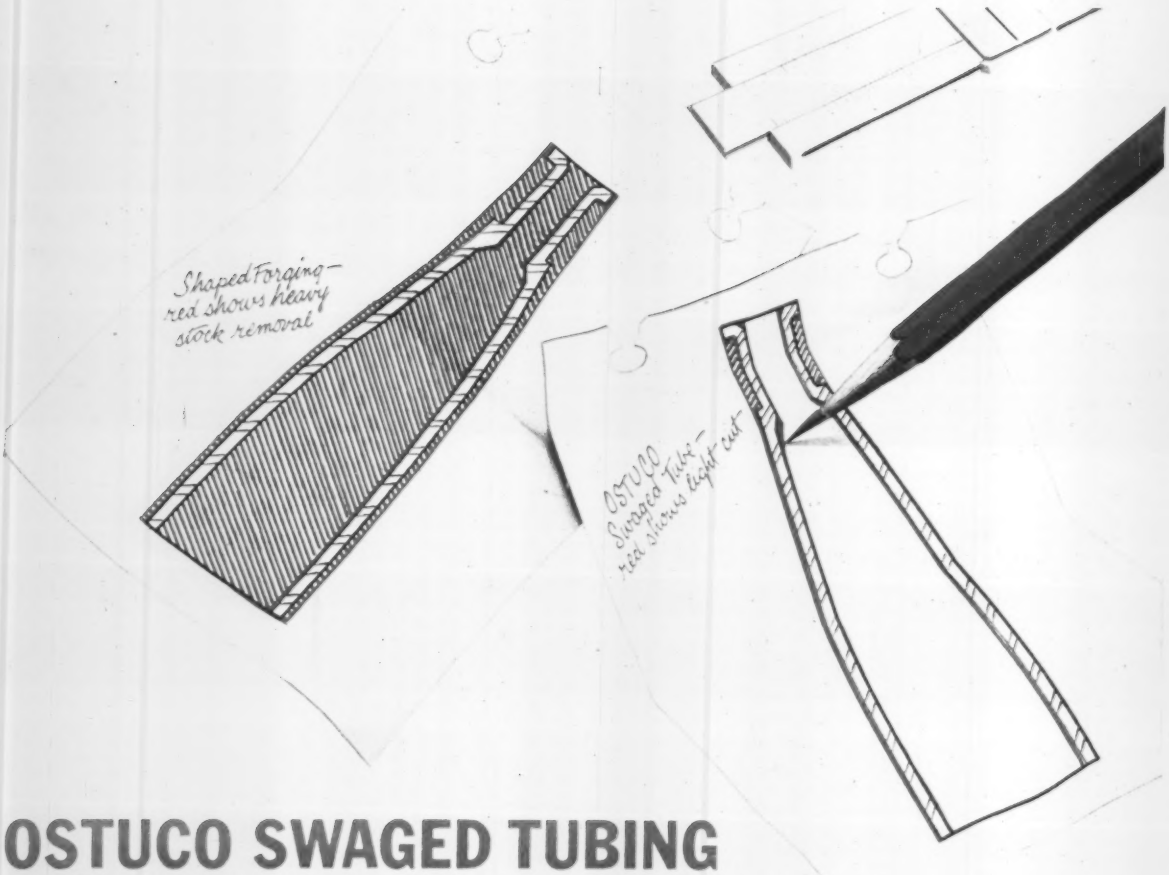

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ups aircraft parts production 82%

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So the producers, The "Special" Corporation, brought their problem to Ohio Seamless. The solution—an Ostuco Swaged Tube.

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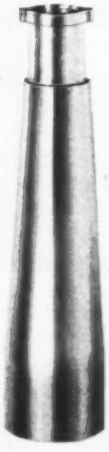

Photo: Courtesy The "Special" Corporation, Brooklyn, N. Y.

FIFTY YEARS
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OSTUCO TUBING
1908 1958

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RICHARD M. JOHNSON
president of Koehler Aircraft

RAYMOND G. HORNER
Black & Decker marketing

ROBERT E. REID
Hyprez general manager

EDWIN H. BURKE
Morgan Eng. chief engineer

Richard M. Johnson was made president, **Koehler Aircraft Products Co.**, Dayton, Ohio, subsidiary of New Britain Machine Co. He was vice president-general manager.

Raymond G. Horner fills the new post of vice president-marketing, **Black & Decker Mfg. Co.**, Towson, Md. He was vice president-sales planning. His appointment follows resignation of **John F. Spaulding**, vice president-general sales manager. Mr. Horner's duties encompass both former offices.

B. W. Reeve was elected president, **Lake Shore Inc.**, Iron Mountain, Mich. He succeeds the late **F. A. Flodin. R. S. Shepard**, manager of Minnesota operations, was elected vice president.

David Applebaum was made vice president and manager of the Chicago branch of **Kasle Steel Corp.** He was sales manager in Detroit, and is succeeded by **Robert Kasle. Herbert Ockenfels** and **Joe Bishop** were promoted to assistant sales managers; **Leonard Trunsky** to assistant to the sales manager.

William P. White Jr. was made general manager-package engineering for **Continental Can Co.** He is in Chicago.

Walter E. Schirmer was elected president; **Martin E. Graham**, vice president-general manager of **Clark Equipment International C. A.**, a subsidiary of Clark Equipment Co., which handles overseas business for the parent company.

Robert E. Reid was promoted from assistant manager to general manager, **Hyprez Div.**, Engis Equipment Co., Chicago. **Walter B. Panko** was made national sales manager, succeeding **Joseph M. Throckmorton**, retired.

Chester L. Ward was made vice president-general manager, **Molded Fiber Glass Co.**, Ashtabula, Ohio. He formerly operated his own reinforced plastics consulting firm in San Francisco. From 1951 to 1956, he was vice president-engineering and production, Kimball Mfg. Corp.

H. R. Oldfield Jr., former general manager of **General Electric Co.'s** computer department, Phoenix, Ariz., was appointed general manager of a new company component, the name of which has not yet been disclosed. He is succeeded by **C. C. Lasher**, formerly manager of marketing for the computer department.

Clarence D. Thurnes was made superintendent, continuous welding furnaces and primary finishing department, West Virginia Works, **Wheeling Steel Corp.**, at Benwood, W. Va. **Louis F. Jagucki** was made superintendent of the finishing, warehousing, and shipping departments.

Allied Research Products Inc., Baltimore, announces new officers as a result of the merger of Wagner Bros. and Allied Research on May 1: **H. C. Irvin**, president; **Jules Horelick**, vice president; **F. M. Mansfield**, vice president; **Harry C. Quast**, secretary; **Joseph W. Agerson**, assistant secretary.

Edwin H. Burke was made chief engineer, **Morgan Engineering Co.**, Alliance, Ohio. He joined the firm in 1955 as chief engineer of all mill machinery.

Ramo-Wooldridge Corp., Los Angeles, named **Dr. Ralph P. Johnson** group vice president in charge of the general electronics group of divisions. **Dr. Burton F. Miller** becomes vice president and director of advanced systems planning; **Milton E. Mohr**, vice president-engineering in charge of the control systems division, communications division, and the Electronic Instrumentation Co., the latter in Denver. **Irvin A. Binder**, vice president-manufacturing, is in charge for both Denver and Los Angeles activities of the manufacturing division.

George F. Robichaud was made manager of marketing development for **Chain Belt Co.**, Milwaukee.

Philip E. Cunningham was named new product manager for the excavator line of **Koehring Div.**, Koehring Co., Milwaukee. **Edward R. Gee** was made northeastern district representative.

Robert J. Nebesar was named general manufacturing manager, **Zenith Plastics Co.**, Los Angeles.

Jerome Davis was named vice president and director of manufacturing, **Waring Products Corp.**, Los Angeles.

Edward C. Kenney joined **Charles Hardy Inc.**, New York, as vice president. He was with Ekstrand

FRED A. EMM

A. OLIN GRIMES

JOHN R. HURSH

Armco Steel and subsidiary appointments

& Tholand Inc. in the sale of sponge iron powder.

At **Armco Steel Corp.**'s Baltimore Works, **Fred A. Emm** was made assistant to the manager and **A. Olin Grimes**, general superintendent of the stainless steel plant. **John R. Hursh** was named chief engineer of products engineering staff of **Armco Drainage & Metal Products Inc.**, Middletown, Ohio, subsidiary. He succeeds **George E. Shafer**, retired vice president-engineering. **Paul Buker** was made supervising product engineer in charge of all building design for the subsidiary.

Pennsalt Chemicals Corp., Philadelphia, appointed **James H. Cogshall** sales manager; **Robert S. Mercer**, manager of development in the corrosion engineering products department.

Harry L. Harner was made western regional sales manager, **Alloy Tube Div.**, Carpenter Steel Co., San Francisco.

L. Rene Gaiennie was elected vice president of industrial and public relations, **ACF Industries Inc.**, New York. He succeeds **Albert L. Kress**, who remains a staff vice president.

William J. Neuhauser was made plant manager, foil rolling plant, Louisville, for **Reynolds Metals Co.** He succeeds **Frank Ballard**, transferred to Richmond, Va., as technical staff assistant to the foil rolling division manager.

Atlas Powder Co., Wilmington, Del., elected **Ralph K. Gottshall** chairman in addition to his position as president. As chairman, he succeeds **Isaac Fogg**, retired. **Edward J. Goett**, senior vice president, was elected executive vice president. **Edward J. Massaglia**, general manager-operations, chemicals division, was elected vice president-general manager of the newly consolidated chemicals division.

S. L. Weaver was made Chicago district sales manager, **Latrobe Steel Co.**

Wayne M. Gideon was elected president, **Lima Electric Motor Co.**, Lima, Ohio. He was executive vice president.

William L. Disston was made western regional sales manager, defense division, **Budd Co.** He is in Los Angeles.

Maxwell C. Scott was made assistant manager of the Buffalo operations, electronic systems division, **Sylvania Electric Products Inc.**

Crane Co., Chicago, appointed **William B. Gilmour** general merchandising manager; **Darrell R. Nordwall**, general sales manager.

Paul J. Fountain was named manager of stainless steel sales, Boston plant, **Joseph T. Ryerson & Son Inc.** He replaces **Philip B. van Horne**, who becomes consultant, stainless sales.

Russell N. Ward was elected president, **E. J. Lavino & Co.**, Philadelphia. He succeeds **Edwin M. Lavino**, now chairman.

E. C. Shawe was made quality control manager, **Dodge Div.**, Chrysler Corp., Detroit. **R. C. Kobus** was

J. A. GEHLING

R. E. ISAACSON

E. E. STVAN

White Sewing Machine vice presidents

T. S. BEDNAR

White Sewing Machine Corp., Cleveland, appointed four new vice presidents. Named are: **J. A. Gehling, R. E. Isaacson, E. E. Stvan**, and **T. S. Bednar**. Mr. Gehling continues as general manager of White's Apex Reinforced Plastics Div. Mr. Isaacson continues as general manager of the sewing machine division; Mr. Stvan continues as general merchandising manager of the industrial supplies and machinery distributing organizations — namely, Strong, Carlisle & Hammond Div., Cleveland; H. P. Weller Supply Co., Erie, Pa.; and Boyer-Campbell Co., Detroit. Mr. Bednar continues as general manager of White's Strong, Carlisle & Hammond Div.

Three-time ABC winner, famous bowler BILL LILLARD slams in strike after strike sending ball and pins flying against piece of TI-CO set up in pit. Close up examination by Bill shows plenty of punishment but no flaking. TI-CO's zinc coating rolled with the punch!

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W. R. BARBER *Esco metallurgical adm. mgr.*

ARTHUR E. FRANKS *Johnston & Funk Titanium mgr.*

ALFRED S. DUBINSKY *Alloys & Chemicals Mfg. p.a.*

made manufacturing engineer, Dodge plant.

W. R. Barber, assistant to the vice president-sales, **Electric Steel Foundry Co.,** Portland, Oreg., assumes duties of administrative manager, metallurgical department. **Joe E. McQuaid** was made general sales manager. **Dar G. Johnson Jr.,** former advertising manager, becomes assistant general sales manager, and is succeeded by **R. L. Zwald.**

Robert E. Brown was named manager of the new Houston sales office of **Kaiser Steel Corp.**

Charles Parthum was named sales promotion manager, **Bucyrus-Erie Co.,** Milwaukee. He was with Harnischfeger Corp.

Alvah S. Bunday was made Chicago district sales manager, **National Steel Corp.** He is replaced as assistant district sales manager by **John J. Gallagher.** Mr. Bunday succeeds the late **Harry C. Smith.**

J. H. Dalton was elected vice president-finance, **Servo Corp. of America,** New Hyde Park, N. Y. He was assistant to the president.

John E. King was appointed sales manager, **J. W. Rex Co.,** Lansdale, Pa.

Babcock & Wilcox Co., tubular products division, appointed **G. H. Weight** sales manager, middle states, with headquarters in Chicago; **J. H. Roach,** Tulsa, Okla., district sales manager; **W. C. Mohrman,** Houston district sales manager. Mr. Weight succeeds **Leon B. Wohlgemuth,** recently made general sales manager for the division.

Arthur E. Franks was made manager of operations, **Johnston & Funk Titanium Corp.,** Wooster, Ohio, subsidiary of Mallory-Sharon Metals Corp. He was division superintendent of Vacuum Metals Corp., division of Crucible Steel Co. of America.

John M. Mitchell was elected president, **Alcoa International Inc.,** subsidiary of Aluminum Co. of America, Pittsburgh, and its foreign marketing organization.

Robert B. Noren was made sales manager, special products division, **Chicago Screw Co.,** Bellwood, Ill., a division of Standard Screw Co.

Raymond G. Hann was named supervisor of procedures for **United States Steel Supply Div.,** Chicago, U. S. Steel Corp.

Frederick L. Banta was made director of research, **Spincraft Inc.,** Milwaukee. He is succeeded by **Joseph Konecny** as plant superintendent.

Everett J. Long was made director, transducer division, **Consolidated Electrodynamics Corp.,** Monrovia, Calif. He succeeds **Kennett W. Patrick,** who is vice president in charge of Monrovia divisions. **Daniel E. Murphy** was made administrative manager, Datalab Div., Pasadena, Calif. He was president of Otto K. Olesen Co.

William M. Gourley was made manager, engineering administration, government and industrial division, **Philco Corp.,** Philadelphia.

Arthur Motycka was made plant engineer of **A. M. Byers Co.'s** southside Pittsburgh plant. He succeeds **O. M. Tishlarich,** retired.

Alfred S. Dubinsky was appointed director of purchases, **Alloys & Chemicals Mfg. Co. Inc.,** Cleveland. He was scrap purchasing agent.

Vincent E. Flaherty was appointed automotive industry manager for **Kaiser Aluminum & Chemical Sales Inc.** He is in Detroit.

Ralph E. Herzler Jr. was appointed aluminum specialist for **Chase Brass & Copper Co.,** subsidiary of Kennecott Copper Corp. He will be in the Chicago office.

James R. Jones was made manager of Army contracts at **Ford Instrument Co.,** division of Sperry Rand Corp., Long Island City, N. Y.

Richard S. Newlin, vice president-operations, Anaconda Co., New York, was elected president of the subsidiary, **Greene Cananea Copper Co.**

Gordon P. Smith was elected director of traffic, **Colorado Fuel & Iron Corp.** He is in Claymont, Del.

OBITUARIES...

William F. Avery, 62, vice president-purchasing, **Wellman Engineering Co.,** Cleveland, died July 19.

L. M. Nesselbush, president and general manager, **Falcon Foundry Co.,** Lowellville, Ohio, died July 12.

Arthur M. Edwards, 69, retired vice president, **Pratt & Letchworth Co.,** Buffalo, died July 10.

August W. Muir, 52, a superintendent, **Ingalls-Shephard Div.,** Harvey, Ill., Wyman Gordon Co., died July 13.

Milton T. Smith, 57, a former vice president, **Bucyrus-Erie Co.,** South Milwaukee, Wis., died July 13.

W. W. Gilmore, 62, president, **Microswitch Div.,** Minneapolis-Honeywell Regulator Co., Minneapolis, and a vice president of the parent firm, died July 10.

Raymond V. Bowman, purchasing agent, **Lipe-Rollway Corp.,** Syracuse, N. Y., died July 10.

Emil Brown, 79, president of **Dura Steel Products Co.,** Los Angeles, and **Emil Brown & Co.,** died July 15.

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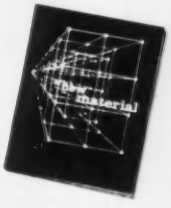

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Bolsters Oxygen Supplies

Generating plant will help increase Granite City Steel Co.'s steelmaking capacity to 1,584,000 tons. Gas producing plant at Erie, Pa., will supply Erie Forge and other industries

USE OF OXYGEN in industrial processes, especially steelmaking, continues to increase sharply. Oxygen generating plants have been brought into production at Granite City, Ill., and Phoenixville, Pa.; others are planned for Erie, Pa., and Chicago.

The Granite City Steel Co. unit will supply the firm with about 48 million cu ft of oxygen a month, almost six times the amount it had been obtaining from two smaller generators. Most of the new supply is being piped to the company's seven open hearth furnaces. It will: 1. Increase flame temperatures. 2. Accelerate the removal of carbon from the molten steel during the refining period in the furnaces.

Boosts Steel Output — The increased use of oxygen is one of the means Granite City Steel is using to raise the annual steelmaking capacity of its open hearths to 1,584,000 tons, scheduled to be reached sometime in 1959.

The new generator was built by Air Products Inc., Allentown, Pa., and is being leased to Granite City Steel under an arrangement which provides for oxygen supply over a 15-year period.

An oxygen generating facility is now on stream serving the Phoenix Iron & Steel Co., Phoenixville, Pa. Built by Air Products, the facility supplies high purity oxygen for surface preparation of ingots used in the firm's new rotary forging seamless steel tube and pipe mill. Phoenix Iron is a subsidiary of Barium Steel Corp., New York.

Air Products is also constructing an oxygen generating plant for Acme Steel Co., Chicago. It will provide a constant stream of oxygen for conversion of iron into steel via the top-blown oxygen conversion process.

National Cylinder Gas Div., Chemetron Corp., Chicago, will construct an industrial gas producing plant on leased premises of Erie Forge & Steel Corp., Erie, Pa. The plant is basically for the purpose of supplying oxygen by pipeline to meet the steelmaking requirements of Erie Forge. The unit will also supply oxygen to other industries and to hospitals in the Erie area.

Initial capacity of the Erie plant will be about 7.5 million cu ft of gas per month; it will be capable of expanding to double this capacity. The plant is expected to be ready for operation by the first of the year.

Will Make Metal Powders

Metal Atomizing & Processing Corp., Hamilton, Ont., will pioneer processes for the production of metals and alloys in powder form. The company plans to build a $300,000 plant. Founded by a group of German metallurgists, the company is being financed by Jacobus Mining Corp. Ltd., Toronto, Ont.

Enlarges Tubing Mill

Sawhill Tubular Products Inc., Sharon, Pa., is constructing an addition to its plant to provide more space for fabricating rigid conduit tubing. Estimated cost: $100,000.

Plans Truck Body Plant

Niagara-Heil Body Co. plans to build a $100,000 plant at Rochester, N. Y., to make truck bodies and hoists. It will contain 30,000 sq ft.

New Names Announced

Oregania Bridge Co., Lebanon, Ohio, changed its name to Dave Steel Corp. It is a subsidiary of Dave Steel Co., Springfield Gardens, N. Y.

Philadelphia Coke Co. changed its name to Philadelphia Coke Div., Eastern Gas & Fuel Associates. The property was operated as a subsidiary.

Humason Mfg. Co., Forestville, Conn., changed its named to Stanley-Humason Inc., a subsidiary of the Stanley Works of New Britain, Conn. The company makes screw machine products, coil springs, wire forms, flat springs, light stampings and assembled products.

New York Air Brake Co. changed the name of its manufacturing division in Kalamazoo, Mich., to Hydreco Div. The division makes hydraulic pumps, control valves, and cylinders used on earthmoving and material handling equipment, agricultural machinery, and machine tools.

Mirro Aluminum Expands

Mirro Aluminum Co., Manitowoc, Wis., purchased a large slab casting and sawing installation as part of its new $12-million rolling mill which will have an annual capacity of more than 60 million lb of aluminum. Loma Machine Mfg. Co., New York, is supplying the semicontinuous casting station and the circular slab saw with auxiliary conveying equipment.

GE Opens Research Unit

Foundry Dept., General Electric Co., Schenectady, N. Y., has opened its $750,000 applied research and development laboratory. The facility provides the vital link between pure research from which new materials and processes are developed and foundry use of such materials and methods as castings and improved production techniques. Among the equipment being used is a 9-ft diameter vacuum degassing chamber to improve methods of eliminating gaseous impurities in molten cast metals. Other projects underway include development of improved methods of vacuum melting and processing of cast alloys to reduce impurities and improve cast properties; improved precision casting methods; and methods for reducing the quantity of metal needed for risers in castings.

Plans Magnesia Plant

Michigan Chemical Corp., St. Louis, Mich., plans to build a seawater magnesia plant at Port St. Joe, Fla., having initially a capacity of about 150 tons a day and ultimately of 300 tons. The plant will provide industry with high-purity chemical and refractory grades of magnesium oxide.

Enters Thin Strip Market

Seymour Mfg. Co., Seymour, Conn., has installed an automatic, electronically controlled strip annealer. It enables the firm to turn out products (nickel silver, phosphor bronze, brass, and other alloys) down to 0.001 in.

Arsenal To Buy Equipment

A $4,963,665 project at Watervliet (N. Y.) Arsenal has been approved by the Department of Defense, Washington. Of the total, $3.5 million will be expended on a new electrical system needed to meet demands of advanced production and tooling methods. The balance will be used for purchase of machine tools and equipment

Shifts Equipment Unit

Westinghouse Electric Corp., Pittsburgh, transferred responsibility for manufacturing and marketing of electric heating equipment from Sunnyvale, Calif., to its Air Conditioning Div. plant at Staunton, Va. Electric heating will be coordinated with the manufacture of heat pumps, air conditioners, and gas and oil furnaces.

Zurga Inc. Expanding

Zurga Inc. is erecting a 10,000 sq ft addition to its plant at 24000 Lakeland Blvd., Cleveland 23, Ohio. The firm designs and manufactures gang drilling and tapping machines, multiple spindle gearless drill heads, broaching machines, collets, and collet fixtures.

Acquires Furnace Business

Hevi-Duty Electric Co., Milwaukee, acquired the furnace business of Eclipse Fuel Engineering Co., Rockford, Ill. The line includes fuel-fired heat treating, forging, and melting furnaces and will be added to Hevi-Duty's established line of electric heat treating furnaces.

Installs Annealing Line

Tennessee Coal & Iron Div., U. S. Steel Corp., Fairfield, Ala., will install a continuous annealing line as part of a modernization project at its Fairfield tin mill. "The new installation, replacing obsolete box annealing equipment, will enable TC & I to enhance its position as a producer of tin plate and to meet the ever growing demands of can manufacturers for tailormade quality tin plate to package consumer products," says A. V. Wiebel, president.

Although it will be necessary to relocate some facilities at the tin mill, Mr. Wiebel expects there will be no appreciable loss of production during the two-year period of construction.

The corporation also announced that a building will be erected for electromechanical development at its Research Center in Monroeville, Pa. W. F. Munford, executive vice president-engineering and research, points out that U. S. Steel's plans call for increased use of instrumentation, process and material handling mechanisms, and automatic control in steel production.

ASSOCIATIONS

American Society for Metals, Cleveland, appointed Adolph O. Schaefer to the unexpired term of secretary following the recent death of William H. Eisenman. Mr. Schaefer is president of Pencoyd Steel & Forge Corp., Philadelphia. Ray T. Bayless, assistant secretary, is also temporary manager in charge of the headquarters offices. Evelyn G. Gardner has been selected for the newly created position of secretary to the board of trustees. She was also appointed secretary of the ASM Foundation for Education & Research.

Purchasing Agents Association of Chicago elected these officers: President, Seymour Ellison, Perfection Gear Co., Harvey, Ill.; first vice president, J. C. Frehner, Bowman Dairy Co.; second vice president, D. L. Harwood, Fairbanks, Morse & Co.; secretary, L. R. Seen, Borg & Beck Div., Borg-Warner Corp.; and treasurer, Harry H. Wise, Cenol Co. Inc.

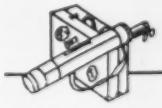
Automobile Manufacturers Association, Detroit, elected these officers: President, L. L. Colbert, Chrysler Corp.; secretary, Harlow H. Curtice, General Motors Corp.; treasurer, P. O. Peterson, Mack Trucks Inc.; vice president, Passenger Car Div., Henry Ford II, Ford Motor Co.; vice president, Commercial Car Div., J. N. Bauman, White Motor Co.; and managing director, Harry A. Williams.

J. L. Singleton, Allis-Chalmers Mfg. Co., Milwaukee, was elected president of the **National Electrical Manufacturers Association,** New York, to fill the unexpired term of the late W. V. O'Brien.

NEW OFFICES

Commercial Shearing & Stamping Co., Youngstown, opened a branch sales office at 120 Halsted St., East Orange, N. J. Melvin E. Stewart is eastern regional sales manager.

George R. Churchill Co. Inc., Bingham, Mass., established a sales office and warehouse at 18055 James Couzens, Detroit, Mich. James E. Lekander is manager of the facility, known as George R. Churchill Sales Co. The firm makes a line of finger buffs used for metal finishing operations.



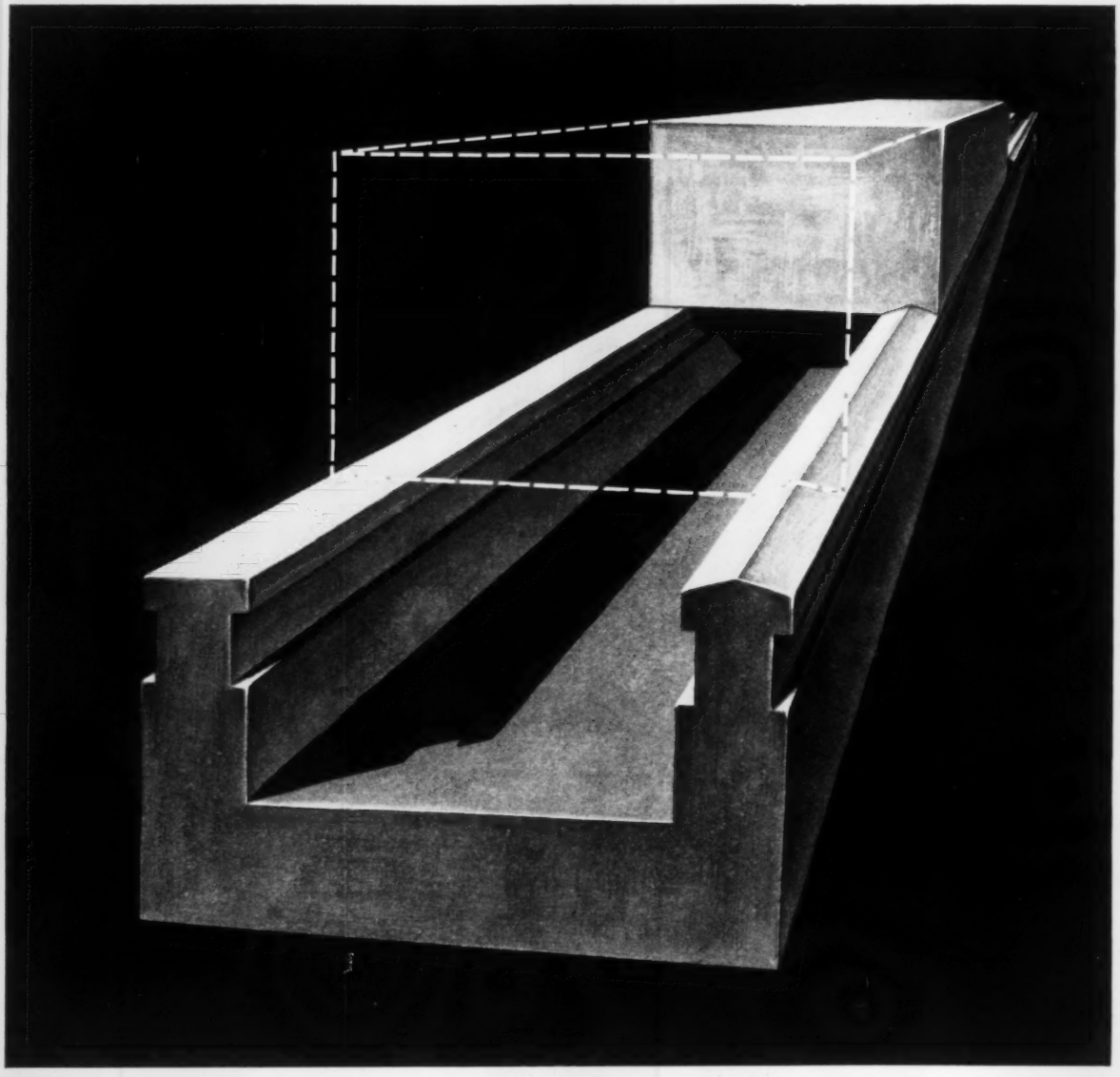
VACATIONS

Whiting Corp. and **Swenson Evaporator Co.** will close its main plant at Harvey, Ill., and its branch plant at Norwalk, Calif., July 28 through Aug. 8. A skeleton force will handle emergency orders and incoming material.

Pines Engineering Co. Inc. (tube fabricating equipment), Aurora, Ill., will close its plant Aug. 2 through Aug. 16.

National Cash Register Co., Dayton, Ohio, will shut down its manufacturing operations in that city from Aug. 4 to Aug. 25. Employees in other departments will return to work on Aug. 18.

Warner & Swasey Co. will close its manufacturing plants in Cleveland and New Philadelphia, Ohio, from Aug. 11 through Aug. 22. No shipments will be made or received during the period.



for smooth, steady sliding way action

Febis K lubricants – specially formulated to prevent the irregular, stick-slip motion of slow-speed sliding ways in machine tools – are equally effective in higher speed operations. The special composition of Febis K lubricants gives them the unusual property of providing lower *static* friction than *sliding* friction. As a result, moving parts, starting with a low force, will not jump ahead. Febis K lubricants provide smooth, steady sliding action... assure better precision work. Febis K lubricants also help reduce wear because of their strong adhesion to sliding surfaces. And they have mild EP and rust-preventive properties. Febis K lubricants are available in *two* grades: *Febis K-53* for small- and medium-size machines, and *Febis K-73* for heavy machines. Both Febis K lubricants have passed the Cincinnati Milling Machine Company's stick-slip test and have been checked and approved by the Bijur Lubricating Corp. for use in their automatic lubrication systems. For further information, contact your nearest Esso office in New England, New York, New Jersey, Pennsylvania, Delaware, Maryland, Virginia, West Virginia, the Carolinas, Tennessee, Arkansas, Louisiana, and the District of Columbia. Or *write* Esso Standard Oil Company, 15 West 51st Street, New York 19, N. Y.

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PETROLEUM PRODUCTS

Technical Outlook

RADIOACTIVE ACTIVITY—More than 350 U. S. firms use industrial beta rays to check the density and thickness of paper, plastics, metals, and coated materials, says Dr. Robert S. Rochlin, General Electric Co., Schenectady, N. Y. Another check of its importance: The Atomic Energy Commission estimates that those firms save $400 million a year with devices that depend on a radioactive source. In five years, it says such savings will rise to $5 billion.

BETTER DUST CATCHING—Use of controlled-corona discharge electrodes in electronic precipitators at an eastern steel plant has doubled gas cleaning ability with only a 30 per cent increase in voltage. The electrodes, called "Koronamax," were installed by Koppers Co., Pittsburgh.

HOT BOND— A new press, built by Clearing Machine Corp., a division of U. S. Industries Inc., Chicago, automatically bonds laminated aircraft sections between two hot plates. The machine, to be used at Convair, San Diego, Calif., is 58 ft long, including tool plates at both ends that permit loading one assembly while the first is being bonded. The hot plates are steam heated to a maximum of 400° F.

CERIUM: A GOOD 'GETTER'— Better, purer, superalloys, are now made possible with the use of high purity cerium, says the U. S. Bureau of Mines. (The metal easily combines with impurities during melting—called "getting" ability.) The development will aid scientists in their search for stronger alloys for rockets and missiles. Another possibility: When flame-sprayed on missile nose cones, the metal is a good heat reflector and ups corrosion resistance.

AMPHIBIOUS TRAINS— "Floating drum" gondolas are being developed in Germany for shipping bulk materials such as coal and ore. The original design is a cylindrical tank lying on its side, with the upper part of the wall cut away. The drums are lashed together into rafts for water shipment. For land transport, they are lifted from the water and placed on railway cars much like those used in the U. S. for carrying and dumping slag thimbles. The most recent design is a double drum which is self-dumping.

RUBBER CONDUCTS ELECTRICITY— Fafnir Bearing Co., New Britain, Conn., encases its line of ball bearings for air-conditioning units with an electric conducting rubber. The design has two advantages: 1. No metal grounding springs or clips are needed to run off static electricity. 2. A possible source of noise is eliminated.

SPEED YOUR COUNTING— You can eliminate time-consuming weighing of small parts with a new, foolproof electronic counter that will tally any item which can be passed through a light beam. Items such as screws, rivets, and washers can be accurately batch counted in quantities up to 1000 a second. The unit is particularly adaptable to counting parts in automatic packaging equipment, says the manufacturer, Electronic Engineering Co., Santa Ana, Calif.

NEW ALUMINUM INGOT— Aluminium Ltd. Sales Inc., New York, says its B51S is just right for extruding structural members like railings, decking, and body parts for vehicles. Of the magnesium silicide group, the composition is said to extrude faster and produce parts with better properties and a higher finish than those now in use.

SAFER STUD GUNS— The Ramset line of powder actuated tools for driving pointed fasteners into metal and concrete has been made safer by a "Flite-Check" device. It prevents a fastener from flying off like a bullet if the gun is discharged accidentally, or into nonresisting materials.

SINGLE SHOT VALVE— Valves made to close or open just once, without fail, are being turned out by Beckman & Whitley Inc., San Carlos, Calif. They go into missile fuel lines, and piping in some process industries. They are actuated by a chemical propellent, set off by an electric current.

How We Beat the Cost Crisis:

New Layout Saves $28.60 per Unit

OLD METHOD

- 10 OPERATIONS
- 13 MEN
- 7.7 MANHOURS PER PART

NEW METHOD

- 8 OPERATIONS
- 9 MEN
- 3.3 MANHOURS PER PART

Better line flow with some new equipment helps this manufacturer turn out liquefied petroleum gas tanks at an annual saving of $85,000. It's another example of cost cutting through more efficient production. The article is one of the top entries in the Cost Crisis Awards Competition. Watch for another next week

THE PRICE of liquefied petroleum gas tanks, like those made by Pioneer Industries Inc., Sioux City, Iowa, dropped nearly 18 per cent in the last 12 months.

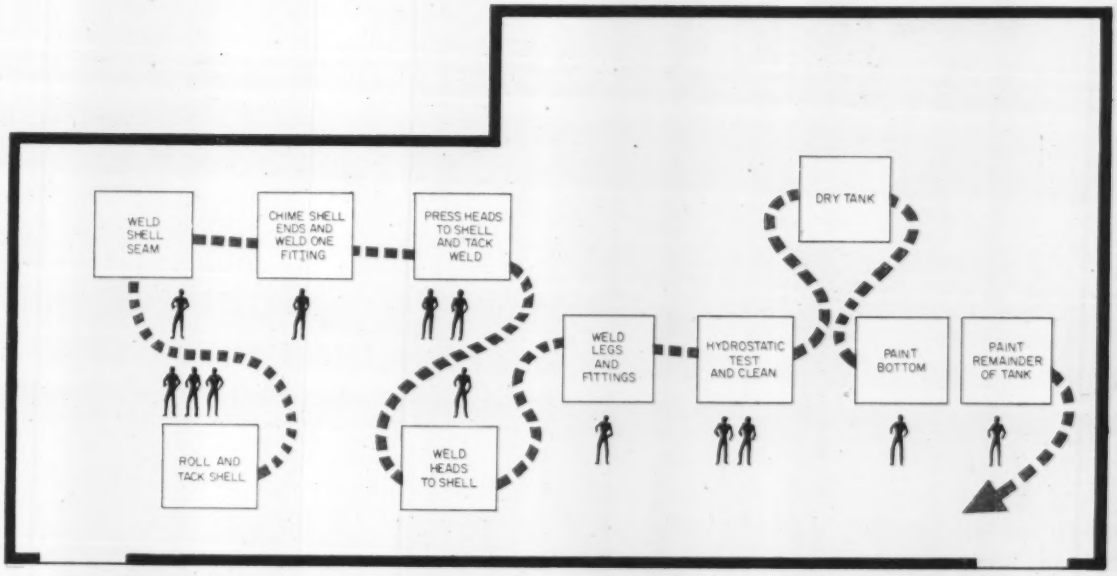
Caught in the competitive squeeze, Pioneer management saw it would have to pare its costs and boost quality or drop its tank line.

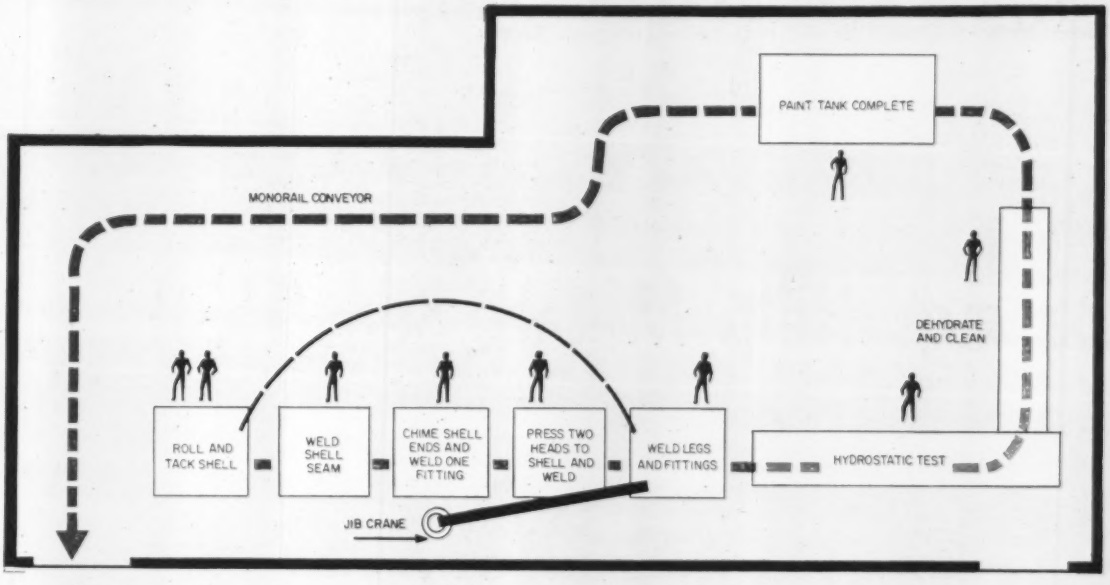
Little could be done to trim material costs, so management concentrated on eliminating some of the 7.7 manhours spent on fabrication. It decided a line flow production layout, with time-balanced operations, would solve the cost problem, says L. F. Kohl, plant superintendent.

The Changeover—The first step was to prepare investment estimates. Based on the flow sheet of the new sequence, the executives figured about $10,000 would suffice.

Next, they set up work standards and an incentive system to save 4.4 manhours on each tank. About $85,000 a year would be saved, based on sales estimates. Mr. Kohl says, "This would make it possible to produce liquefied petroleum gas tanks at a profit, even if prices dropped to the worst possible level."

Finally, material costs were analyzed and parts evaluated to see if


WELD SHELL SEAM
CHIME SHELL ENDS AND WELD ONE FITTING
PRESS HEADS TO SHELL AND TACK WELD
DRY TANK
WELD LEGS AND FITTINGS
HYDROSTATIC TEST AND CLEAN
PAINT BOTTOM
PAINT REMAINDER OF TANK
ROLL AND TACK SHELL
WELD HEADS TO SHELL



they should be bought or made. Result: An additional saving of $6000 a year.

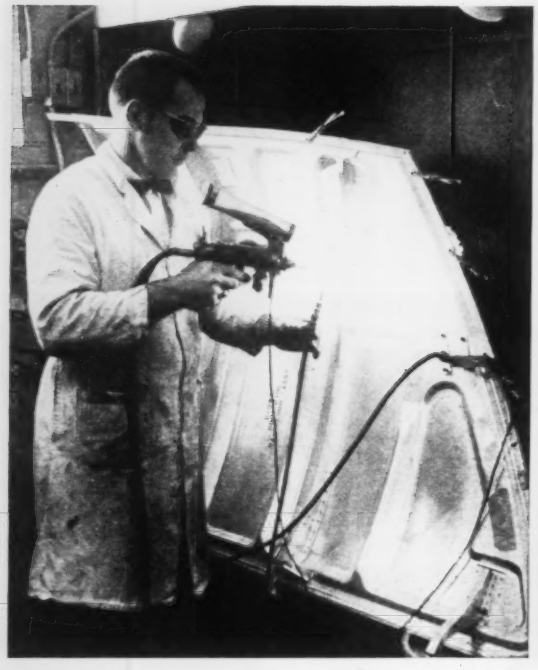
Equipment Changes — A major share of the improvement came when the production machines were relocated to provide the line flow. Material handling underwent change: The overhead crane was eliminated, monorail and roller conveyors were added, a jib crane was put between the second and third operations, and pneumatic pushers and ejectors were placed to move parts out of some machines.

Additional special machines were designed and built to speed some jobs.

The new line has freed four men for other work. The number of operations has been reduced from ten to eight. Testing liquid (500 gallons per part) used to go down the drain. Now, this loss is only 5 gallons per part.

Further, says Mr. Kohl, "Quality and appearance of the tanks are greatly improved."

• *An extra copy of this article is available until supply is exhausted. Write Editorial Service,* STEEL, *Penton Bldg., Cleveland 13, Ohio.*



Flame spraying is one way of getting cermets or special oxides on metal. Engine panel and rocket nozzle can stand much greater punishment with such coatings

Coatings Help Metals Beat Heat

Metalmen can benefit from missile progress, author tells SAE in New York. Modified ceramics, refractory oxides, and new mixtures make cheaper metals last longer

By JOHN V. LONG
Director of Research
Solar Aircraft Co.
San Diego, Calif.

HIGH TEMPERATURE coatings offer metalworkers a way to get more miles from metals.

Examples: An English firm (Bristol Airplane Co.) coated some of its stainless exhaust manifolds. Result: They lasted four times longer than uncoated manifolds.

Solar Aircraft Co. tested some gas turbine combustion chambers. Coated liners outlasted the uncoated ones two or three times.

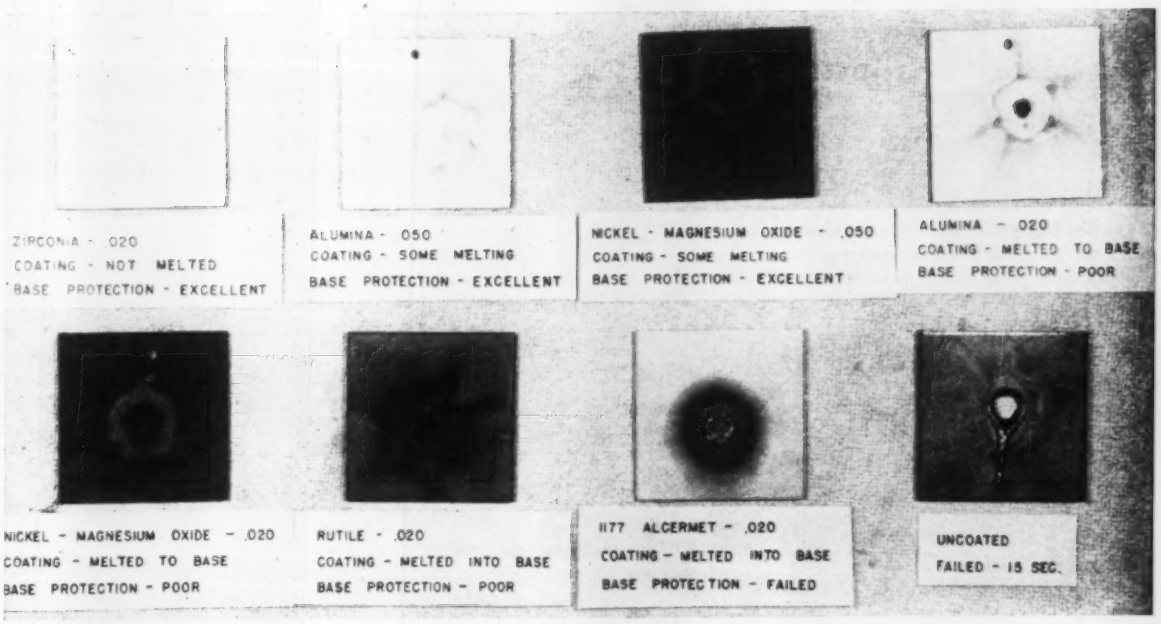
Interesting Properties — You can group coatings in four classes: Ceramics, cermets, metals, and refractory oxides. Dipped, sprayed, baked, or fired, they increase part life and upgrade resistance to corrosion and oxidation.

Ceramic coatings are often called the work horses. They can be used to increase fatigue life, prevent carburization, resist attack by molten zinc and aluminum, and modify surface emissivity or reflectivity.

Special Coatings — Interesting properties for specific use can be obtained by coating modifications. One formula (a modified ceramic) incorporates dry lubricants like molybdenum disulfide or graphite. It inhibits galling and fretting at high temperatures.

The bearing material is effective at 1700° F.

Another modification changes re-


ZIRCONIA - .020
COATING - NOT MELTED
BASE PROTECTION - EXCELLENT
ALUMINA - .050
COATING - SOME MELTING
BASE PROTECTION - EXCELLENT
NICKEL - MAGNESIUM OXIDE - .050
COATING - SOME MELTING
BASE PROTECTION - EXCELLENT
ALUMINA - .020
COATING - MELTED TO BASE
BASE PROTECTION - POOR
NICKEL - MAGNESIUM OXIDE - .020
COATING - MELTED TO BASE
BASE PROTECTION - POOR
RUTILE - .020
COATING - MELTED INTO BASE
BASE PROTECTION - POOR
1177 ALCERMET - .020
COATING - MELTED INTO BASE
BASE PROTECTION - FAILED
UNCOATED
FAILED - 15 SEC.

How various refractory coatings compare in protective value. Test specimens are 1010 steel, 0.125 in. thick. The heat source used in the 20-second test exposure produced a theoretical flame temperature of 5680° F

flection and emission properties, reducing the operating temperatures of parts heated by radiation. A brazed honeycomb afterburner shroud has a reflective coating inside and an emissive coating outside.

Although ceramic coatings are good, base material requirements, coating defects, and high operating temperatures forced researchers to seek coatings with better properties.

Cermets Even Better—Solar has concentrated on mixtures of aluminum alloy powders and ceramic frits. They can be applied to any carbon steel and cast iron without any of the porcelain or ceramic coating defects. They protect carbon steel at 1100° F for long periods without discoloration. Top range: 1200° F.

Applications include exhaust manifolds, furnace parts, mufflers, and heat exchangers.

Cermets are applied like porcelain by spraying or dipping, drying, and firing in gas or electric furnaces at 1235 to 1600° F. They don't run at high temperatures, so you can make them 0.050 in. thick. If you want long-time protection, use 0.003 to 0.004 in. Some operators find that a thin dust coat keeps down oxidation during heat treatment.

Solar's cermet looks like a metal. It has exceptionally high thermal shock and impact resistance and can be quenched from the firing temperatures.

Limitations — Some base metals aren't strong enough to stand firing. To get around that, it's possible to apply cermets by flame spraying. Such a coating protects an aluminum sheet for 10 minutes at 2000° F.

Solar puts aluminum on metal with a technique similar to that used for ceramics. It overcomes the limitations of conventional aluminum coating and permits application on comparatively complicated parts.

Solar starts with a mixture of aluminum powder and ceramic flux applied at room temperature. After drying, it is furnace fired between 1250 and 1450° F. The aluminum deposits out of the flux and forms a diffusion bond with the base metal.

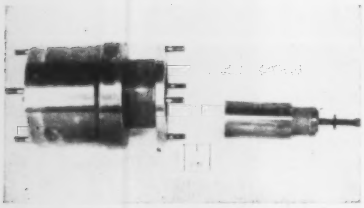
The flux protects it during heating—when cool, it is washed off. For exceptionally high temperature resistance, the coating is further diffused by heat treatment.

Head-On Approach — The direct diffusion method requires the mixing of a more refractory ceramic flux with powdered aluminum. Application is like that of the diffusion method, but firing is between 1650 and 2100° F. Sometimes, an inert atmosphere is necessary.

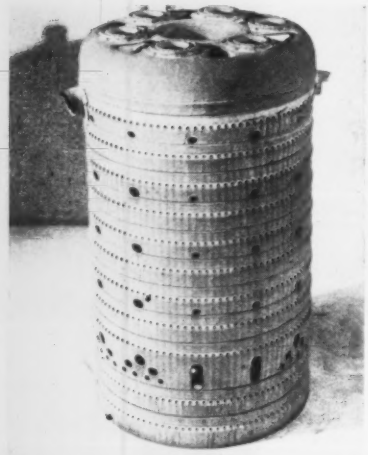
(Besides prolonging part life, a

A Coating of Diffused Aluminum Protects . . .

Metal	Temperature	Type of Attack	Protection Time
AISI 321	2100° F	Oxidation	50 hours
Inconel X	2150	"	100
Haynes Stellite 25	2400	"	10
Carbon steel	1500	"	2000



Some coatings have a built-in lubricant. This slip joint and piston operate at 260 psi, 600° F. Coating reduces operating force from 147 to 98 lb



Aluminizing is comparatively easy on simple, smooth parts. Solar's process handles complex pieces like this jet combustion chamber liner

coating of aluminum can keep brazing fixtures operating longer. A stainless retort for brazing honeycombs lasted five times longer when coated.)

Supershields Getting Practical—Missile needs have spawned a series of insulating coatings. Solar studies show that certain refractory oxides, when powder flame sprayed, provide short time protection at temperatures over 3000° F.

Zirconium and aluminum oxide have been kept in the spotlight a great deal.

A nickel-magnesium oxide also shows promise.

Advice—To get top benefits for protective coatings, it is best to consult organizations with experience. Solar believes that you can make the most progress with a capable materials engineer.

• *An extra copy of this article is available until supply is exhausted. Write Editorial Service,* STEEL, *Penton Bldg., Cleveland 13, Ohio.*

New Kirksite Ups Die Life

Advantages include a harder surface and the ability to withstand deeper draws. Finer grain and improved castability make it easier to handle than Formula A

A BETTER grade of Kirksite has been added to the growing list of materials for short run dies.

Called Hi-Phy, the formula was developed by the National Lead Co., New York. Several aircraft and auto firms (including Convair, San Diego, Calif.) use it.

How It Was Done—The new Convair 880 required a lot of forming tools for the wing splice angle. To get the production metal into the right shape, engineers estimated it might take a stretching force well over 120,000 lb. After several tryouts, Hi-Phy was selected because of its greater strength and abrasion resistance.

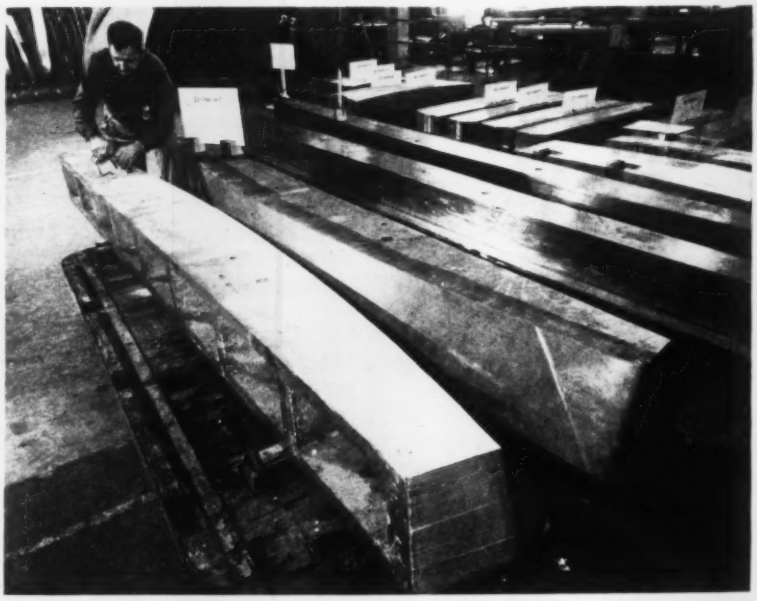
Patternmakers made plasters for each form. The metal was cast in sand molds. Operators used standard practice except for placement of cores. The largest castings are 17 ft long, 10 in. wide. Face and wall thickness are about 2 in.

Convair says that the castings needed a minimum of die surface spotting. Metal shrinkage was even and the grain structure good.

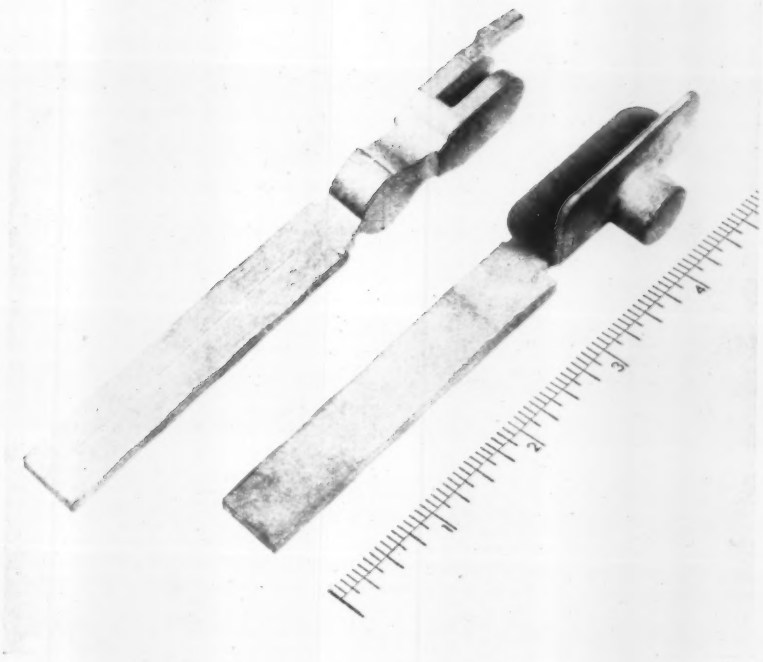
Other Uses — The formula has more than 400 per cent greater impact strength than Kirksite A. National Lead says it's stronger, harder, and resists creep better than the old formula.

A superior grain size makes machining easier, and there is a minimum of grinding and finishing. Greater strength means deeper draws and elimination of stage dies.

When used as a toning metal, Hi-Phy beefs up salvaged drop hammer die metal. Obsolete dies stored outside oxidize heavily in salt air. Toning metal added to the remelt reduces dross loss and improves castability, says Convair.



Here are some of the wing forming dies used at Convair for its Model 880 airplane wings. It chose Hi-Phy for its greater strength and resistance to abrasion



Two 410 stainless parts that were centrifugally cast in investment molds. The parts consistently surpass the minimum required mechanical properties

Centrifugal Casting Upgrades Stainless

By KENNETH H. PIERCE
Vice President
Precision Castparts Corp.
Portland, Oreg.

Type 410 parts show tensiles over 200,000 psi and elongations in excess of 10 per cent when technique is used with investment molds. Key: Close control of variables

MORE manufacturers, especially those in aircraft and missile business, are demanding castings which are moderately heat and corrosion resistant and can be consistently produced with these properties:

Ultimate tensile strength, 200,000 psi or higher; elongation, 6 per cent minimum; reduction in area, 25 per cent minimum.

A readily available steel which should satisfy those requirements is the 12 per cent chromium stainless, Type 410. But few foundries have been able to produce castings which can be consistently heat treated to all the minimum requirements. As a result, most design and stress engineers set tensile and elongation specifications for Type 410 castings below what should be available in the castings, and what is readily available in wrought forms.

New Method Developed — New techniques in casting, developed by Precision Castparts Corp., may provide the solution. By centrifugally casting Type 410 in investment molds, the company has run thousands of parts which have exceeded the minimum strength, elongation, and reduction in area requirements.

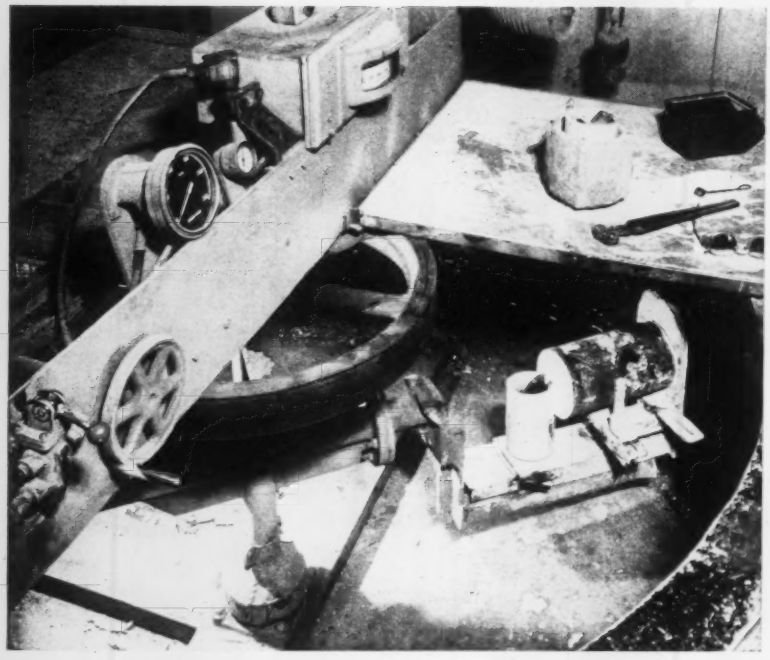
Tests made on coupons sectioned directly from the castings show tensile strengths ranging from 203,000 to 227,000 psi, yield strengths of 162,000 to 191,000 psi, and elongations of 10.8 to 18 per cent.

Factors Affecting Results—These factors are highly important in achieving the required mechanical properties: Centrifuging, chemical composition, mold material and preheat temperature, metal temperature, and heat treatment.

All castings are poured in a horizontal centrifuge, 5 ft in diameter, that develops a total force of about 40 g. The centrifugal force developed within the molten steel drives the heavy, clean metal into the mold cavity, while the lighter impurities (gases, oxides, slag) remain in the gating apparatus. Etching and microscope examination reveal fewer nonmetallic inclusions in centrifuged castings than in castings which are statically poured.

Equipment Selection Critical—The level of mechanical strength is sensitive to the chemical makeup of the master heat employed. Relatively small changes in chemistry, especially in the carbon and chromium elements, tend to reduce performance. Extreme care must be taken in selecting melting equipment, temperature controlling devices, and crucible materials to minimize additions to, or losses from, master heat chemistries.

All metal is induction melted. That permits rapid melting and maximizes freedom from absorbed gases which generally accompany prolonged melting cycles. Also, induction melting is employed (rather than indirect carbon arc melting) because fine control over the carbon content of castings melted in



Centrifuge used to cast stainless parts at Precision Castparts Corp. Centrifugal force drives molten metal up and out of crucible into investment mold

indirect arc furnaces is difficult.

The metal is melted in individual, preformed crucibles, made from high-purity silica to preclude contamination from reaction with the crucible. Monolithic quartz molds are used exclusively. The molds are preheated to temperatures from 1300 to 1600° F with tolerances of plus or minus 25° F. Best and most consistent results come from molds preheated to 1550° F.

The optimum pouring temperature is 2950° F. A recording immersion pyrometer with a thermocouple of platinum and platinum-rhodium provides temperature checks. Every effort is made to control melt temperatures to plus or minus 15° F.

The best and most consistent results are obtained when master heat carbon is 0.13 to 0.15 per cent and chromium is 12.0 to 12.9 per cent.

Heat Treating Cycle—The castings are heat treated in a neutral atmosphere. They are heated at 1650° F, air cooled, then heated at 1825° F and oil quenched. Temperatures are controlled to plus or minus 15° F. Departures from this tolerance frequently result in below-specification properties. Times at temperature vary with the cross-sectional area of the part.

All parts are processed through a −90° F stabilizing cycle before drawing. This is to overcome the austenitizing effect of the 12 per cent chromium and to maximize the transformation from austenite to martensite.

Castings are drawn at 775° F. This temperature was selected empirically as being the one that produced best results and avoided the so-called embrittlement range, which occurs from 800 to 1100° F.

Foundries Can Benefit — The method for casting Type 410 stainless can be applied to other alloys. The techniques lie within easy reach of most modern foundries, either through use of their own equipment and personnel or through the employment of metallurgical service organizations.

Recognition and control of significant variables is the key to successful casting of parts that have superior properties.

• An extra copy of this article is available until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, Ohio.

Tanks Moved Faster

An 80 per cent speedup and 40 per cent labor saving were realized by use of vacuum lifting

HANDLING galvanized water heater tanks in and out of storage used to be a costly operation at Hotpoint Co.'s Milwaukee plant. A trailer-train would be pulled into the storage area and at least two men would load, unload, and stack the tanks manually.

To speed the operation, Hotpoint equipped a fork lift truck with a Vac-U-Lift unit which grips the tanks instantaneously. The Vac-U-Pads are arranged to follow the curvature of tanks of various diameters.

Hotpoint engineers report labor savings amounting to 40 per cent, with 80 per cent faster handling. Better utilization of space through higher stacking also results, say the engineers.

Vacuum lifting has been developed to handle tremendous weights and various shapes. The method is being used with overhead and boom cranes to handle all types of steel, concrete slabs, granite, pipe, glass, ceramic, stone, and tile materials.

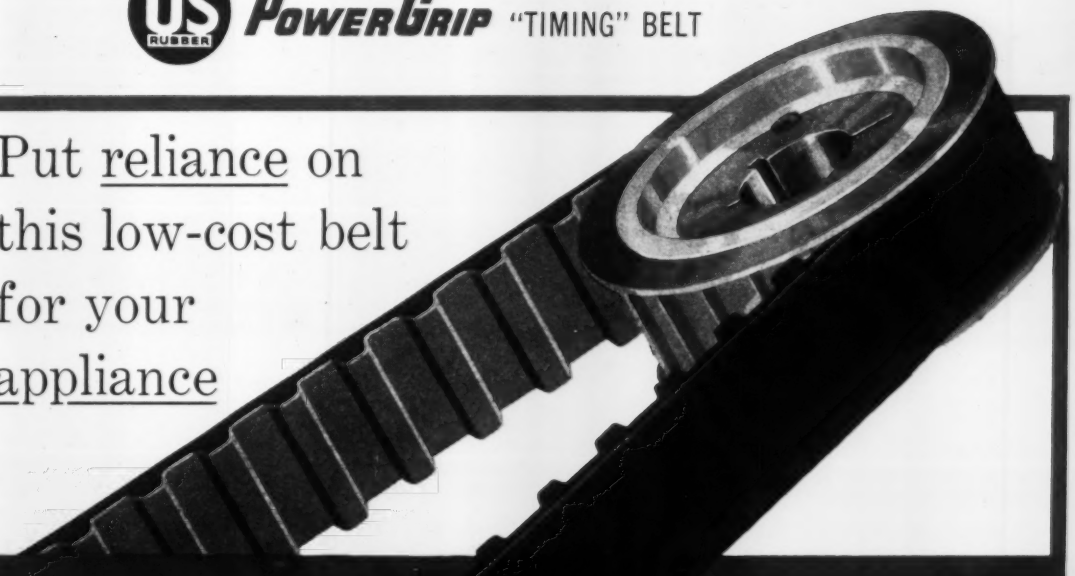
Special vacuum units have been built for automatic turnover and automated handling.

The vacuum handling units are manufactured by Vac-U-Lift Co., Salem, Ill.

Fork lift truck equipped with Vac-U-Lift unit handles tanks at Hotpoint Co.'s Milwaukee plant

US RUBBER **PowerGrip** "TIMING" BELT

Put reliance on this low-cost belt for your appliance



SAVE the "Timing" Belt permits use of a smaller, lower-cost motor

SAVE the "Timing" Belt is reliable—it always works

SAVE with simpler design and fewer units

SAVE it reduces assembly costs

The appliances equipped with PowerGrip "Timing" Belt include:

Air conditioners
Electric typewriters
Lawn mowers
Power tools
Dryers
Washers
Portable tools
Sewing machines
Polishers
Waxers
Sanders

New efficiency with the drive built specifically for appliances

The U. S. PowerGrip "Timing"® Belt has an efficiency of close to 100%. That's why the makers of many kinds of appliances can now combine simplicity of design with split-second response. PowerGrip has no slippage, no take-up—allows short and fixed centers, high ratios. No need for lubrication or housing devices, because there is no metal-to-metal contact. *Quiet!* Handles speeds up to 16,000 f.p.m. or so slow as to be imperceptible to the eye. *Vibrationless!* Simplify and improve your power transmission unit with U.S. PowerGrip "Timing" Belts.

These unique transmission belts are available, along with expert engineering service, at your "U.S." power transmission distributor, or by writing us at Rockefeller Center, New York 20, N. Y. In Canada, Dominion Rubber Co., Ltd.

US RUBBER **Mechanical Goods Division**

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CONTINUOUS ANNEALING: Where It Is Now

(Continuous annealing lines for tin plate in U. S. and Canada)

Installation	Lines	Nominal Speed fpm	Type of Heat	Type of Gas Firing	Water Quench
A	1	100	Electric	(This line has been scrapped.)	No
B	1	200	Electric	None	No
C	1	300	Electric	None	No
D	1	300	Electric	None	No
E	1	300	Gas-electric	Radiant tube, nonrecuperative	No
F	1	500	Gas-electric	Radiant open cup, nonrecuperative	Yes
G	1	1000	Gas-electric	Radiant tube, recuperative	No
H	1	1000	Gas-electric	Radiant tube, recuperative	No
I	1	2000	Gas-electric	Radiant tube, recuperative	Yes
J	1	600	Electric	None	Yes
K	1	600	Electric	None	Yes
L	4	500	Gas-electric	Radiant open cup, nonrecuperative	Yes
M	1	500*	Gas-electric	Radiant tube, nonrecuperative	Yes
N	1	1000	Gas-electric	Radiant tube, recuperative	Yes
O	3†	1500	Gas-electric	Radiant tube, recuperative	No
P	1	800*	Gas-electric	Radiant tube, recuperative	No

*Speed of these lines can be increased from 500 to 1000 fpm, and from 800 to 1200 fpm, with a minimum of added components.
†These are three separate installations in one company. O and P are under construction.

Where Continuous Annealing Is Going

The trend is to large capacity furnaces heated by gas and electricity in combination. Newest installations have shifted from water quench to final air cooling

By N. B. JONES
Industrial Heating Dept.
General Electric Co.
Shelbyville, Ind.

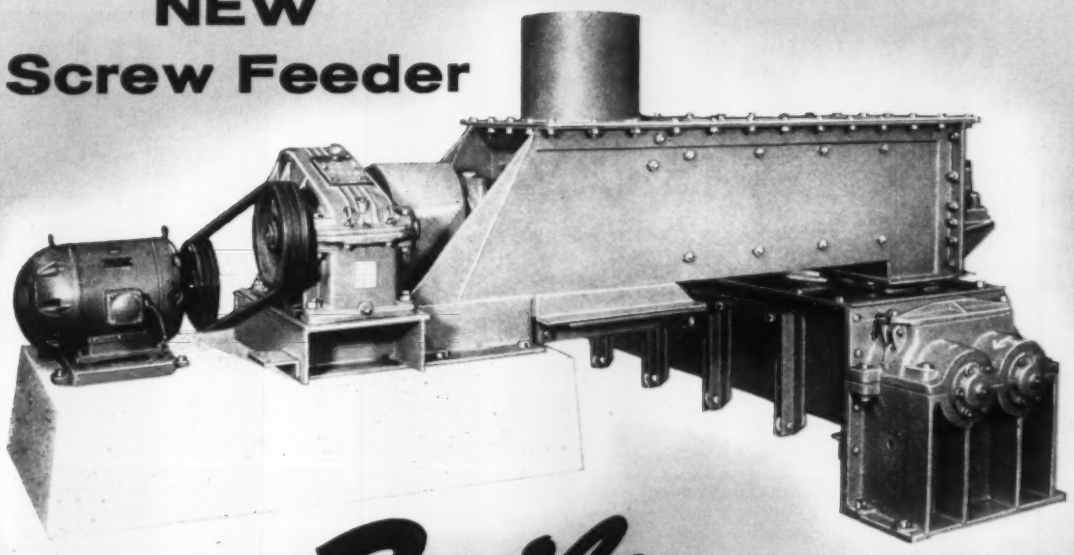
THE FIFTEEN continuous tin plate annealing lines in operation and the one under construction in the U. S. and Canada represent more than 300 tons per hour of capacity. (See list above.)

Capacity should increase considerably within the next few years. New batch annealing furnaces will be put in, and some obsolete batch equipment will be retired and replaced by continuous installations.

Trends—The table above shows trends over the years to: 1. Larger capacities. 2. Combination gas-electric heat. 3. Use of a water quench for final cooling, now shifting back to dry cooling.

The use of gas for the heating-up portion of the furnace is a matter of economics: Canadian fur-

NEW Screw Feeder



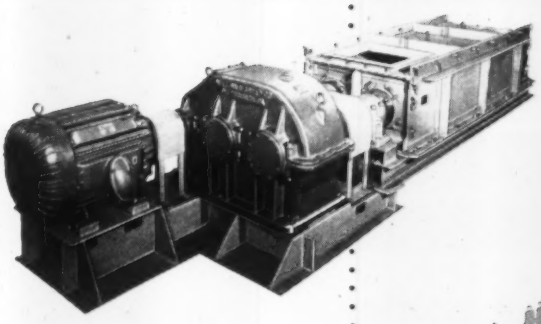
MAKES *Bailey* PUG MILLS

EVEN MORE EFFECTIVE IN SINTERING PLANT AND BLAST FURNACE DUST CATCHER SERVICE

The new Bailey Screw Feeder is effective for flow regulation and conveying of flue dust, ore fines and various other materials. An outstanding feature is that it maintains uniform flow, even when irregular feeding may be caused by "hanging" of material in dust catcher or a sudden furnace "slip." The feeder speeds the sintering process and assures substantial savings through reduced handling costs.

BAILEY PUG MILLS were developed for low-cost processing of greater tonnages of more uniform sintered products. They are built for continuous service, in capacities from 100 to 400 tons per hour.

Write for Bulletins



This Bailey Double Shaft Pug Mill is equipped with a double helical gear reduction unit. Types of Bailey Pug Mills available include single and double shaft types, with direct or rope drives.

WILLIAM M. *Bailey* COMPANY
ENGINEERS
LEADERSHIP THROUGH QUALITY
1221 BANKSVILLE ROAD PITTSBURGH 16, PA

naces are all electrically heated because of a cost advantage. The purchaser must consider both product and operating differences (including fuel economy) which result from various time-temperature cycles.

Time—The optimum time cycle has been the subject of much discussion and perhaps some disagreement. Three typical ones are shown in Fig. 1. Curve A is for a direct-fired furnace with no holding time. Curve B is for a radiant tube-fired furnace with an 18-second hold and water quench. Curve C is for the same type furnace and holding time as B without water quench.

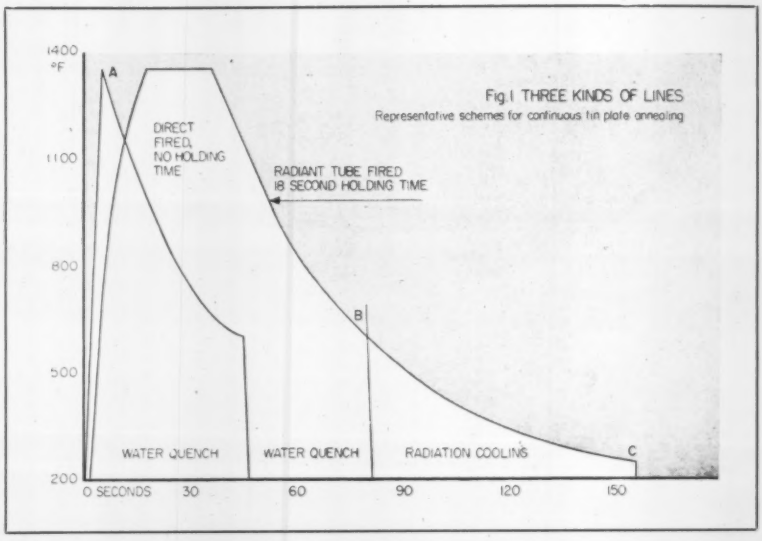
All are without forced convection and with retarded cooling to 900° F. (With forced convection the cooling rates can be increased, but some operational problems are introduced.) The cycle for one recently installed furnace (N in the table) would be approximately that indicated by Curve B of Fig. 1.

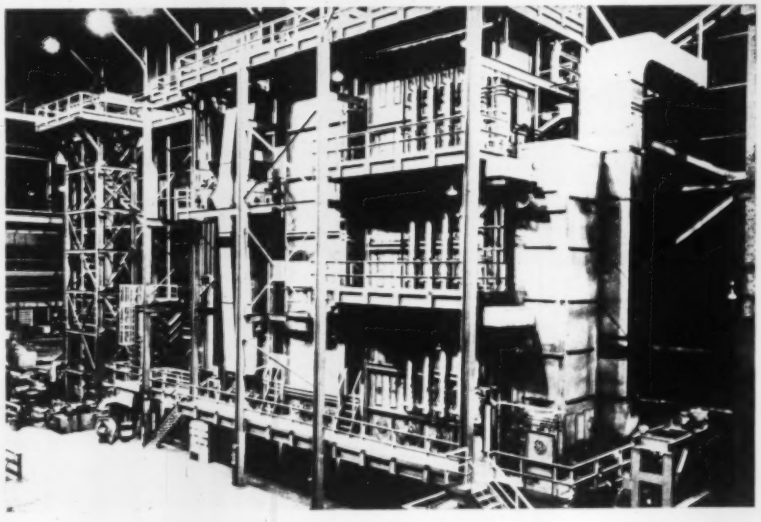
Heat—It's generally agreed that 4 to 24 seconds may be taken to reach 1350° F without making a significant difference in the quality of the product. The present trend is to allow equal time (12 to 18 seconds) for holding and for cooling between 1350 and 900° F.

Metallurgists usually place no restrictions on the cooling rate below 900° F. Exception: If quenching is used, the maximum quench temperature should not be above 600° F. The approximate time from 900 to 600° F is 24 seconds.

Size—With the trend to larger units, a lot of interest has been shown in the dual output furnace typified by the recent General Electric installation for the No. 2 tin mill at Youngstown Sheet & Tube Co.'s Indiana Harbor Works, East Chicago, Ind. It can have a nominal rating of 15 tons an hour with provisions for economical conversion to a 30-ton-per-hour unit. (See Fig. 2 for how it's done.)

This type installation has some evident advantages. A continuous annealing line has many items, particularly the reeling and cleaning equipment, that cost about the same for a 15-ton-per-hour line as for one with several times that output. If a user needs 15 tons an hour today, he hesitates to incur the added capital investment of putting in two or three times more capacity than he needs. The problem can be taken care of by building requirements for higher speed into the line initially, except for the furnace portion.





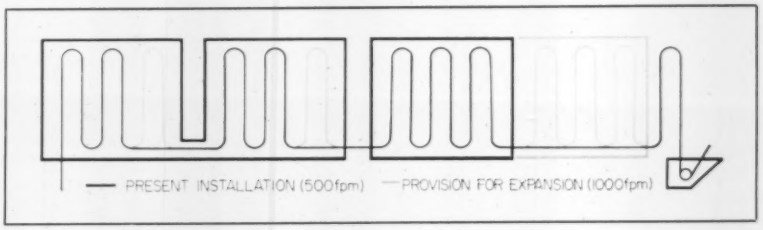


Fig. 2—The Expandable Annealing Line. This 15-ton-per-hour continuous annealing furnace for tin plate at Youngstown Sheet & Tube Co.'s Indiana Harbor Works was designed so its strip speed can be doubled. The diagram shows both schemes

Atmosphere—The early furnaces used unpurified exothermic gas. A partially purified exothermic gas consisting of about 90 per cent nitrogen, 5 per cent hydrogen, 5 per cent carbon monoxide was found to be more satisfactory. Carbon

monoxide was later eliminated to improve the corrosion resistance of the product. The atmosphere used today is purified exothermic gas consisting of about 95 per cent nitrogen and 5 per cent hydrogen, dried to a dew point of around − 50° F (the dew point in the furnace is considerably higher).

A few years ago the generators were supplied with a top rating of 15,000 cu ft an hour, but the maximum has been increased to 20,000. The trend is to higher capacity per unit, and inquiries are being received for 30,000 and 40,000 cu-ft-an-hour units.

Byproduct Nitrogen—In one steel plant, some of the annealing atmosphere is obtained from byproduct nitrogen made by oxygen generators. It is mixed with hydrogen, purified, and dried. Hydrogen is obtained from ammonia dissociators. There is demand for a low-cost generator to supply hydrogen for mixing with byproduct nitrogen.

Byproduct nitrogen could be mixed with the output from purified exothermic gas generators (Neutralene H or HNX) to produce a 15 per cent hydrogen, 85 per cent nitrogen gas. Their output could be tripled by adding twice as much purified nitrogen and still have an atmosphere analyzing 5 per cent hydrogen, 95 per cent nitrogen. Apparently, no steel company is taking advantage of that possibility.

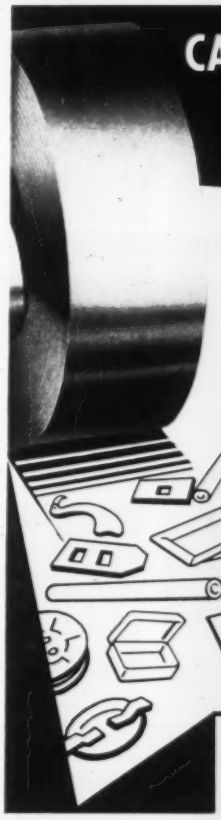
Magnets Speed Handling

A large auto plant is using Magna-Rails to eliminate time-consuming manual handling of parts, conserve aisle space, and increase production speed.

The permanent magnet units are installed beneath a belt conveyor. They maintain a powerful field through the length of the belt. Speeds are high, and the ascent is almost vertical.

A magnetic conveyor takes parts from a drop bottom tub, elevates them, and deposits them in a part feeder for the press. Another magnetic unit picks up finished parts and transfers them to overhead conveyors.

A product of Eriez Mfg. Co., Erie, Pa., the magnetic rails come in several strengths and sizes.



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Whether you are merely after information on the fabrication of pre-painted and electro-galvanized steel, or are looking for a reliable source for these products—Canfield offers every advantage. Canfield is one of three divisions within Life Time Products Corporation, and produces pre-coated steels for further fabrication within the corporation. This experience in the use of their own steels guides every consultation with prospective users. Too, Canfield assures you the same uniform properties and quality it is required to furnish within its own corporate establishment. Capacity to .060x48" wide. Why not consult with a Canfield representative? No obligation, of course.

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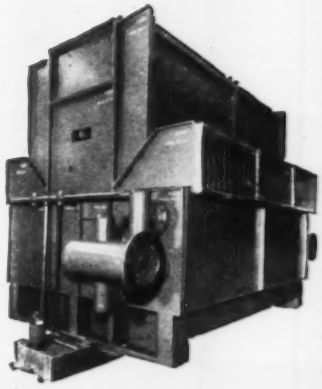
CANFIELD, OHIO

ECONOMICAL COOLING OF GASES AND COMPRESSED AIR



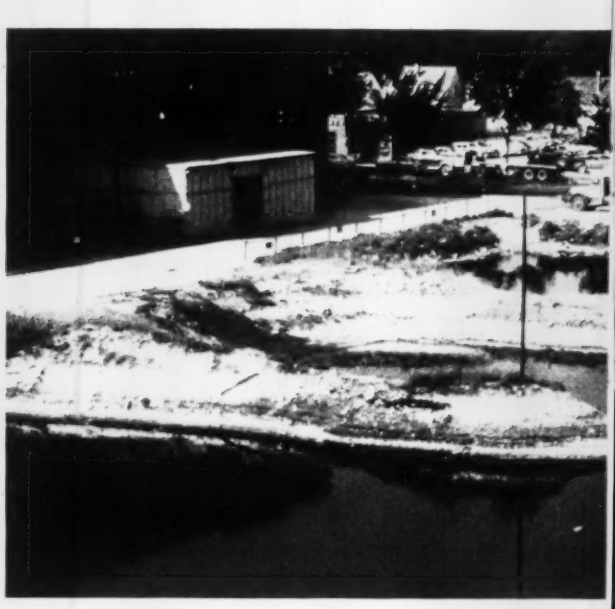
Cooling gases or cooling and removing moisture from compressed air, the Niagara *Aero* After Cooler offers the most economical and trustworthy method. Cooling by evaporation in a closed system, it brings the gas or compressed air to a point below the ambient temperature, effectively preventing further condensation of moisture in the air lines. It is a self-contained system, independent of any large cooling water supply, solving the problems of water supply and disposal.

Cooling-water savings and power-cost savings in operation return your equipment costs in less than two years. New sectional design reduces the first cost, saves you much money in freight, installation labor and upkeep. Niagara *Aero* After Cooler systems have proven most successful in large plant power and process installations and in air and gas liquefaction applications.

Write for Descriptive Bulletin 130.

NIAGARA BLOWER COMPANY
Dept. S-7, 405 Lexington Ave., New York 17, N.Y.
Niagara District Engineers in Principal Cities of U. S. and Canada

Byproducts from this small building . . .



used to fill this unsightly lagooning area . . .

Pickle Liquor Disposal Made Practical

A. O. Smith Corp. has developed a low-cost method which uses lime for neutralization and produces a byproduct which has been found suitable for land fill

WASTE PICKLE LIQUOR, with its high concentration of iron sulfate and low percentage of sulfuric acid, can't be dumped in streams or wells without risking contamination and legal action. Lagoon neutralization ties up good land, and civic bodies don't like what it does to the scenery.

The cost of disposal has to be charged somewhere—probably to plant overhead, although it certainly could be considered part of the cost of production. Every company with pickle liquor to get rid of is looking for a cheaper and socially acceptable way to do the job.

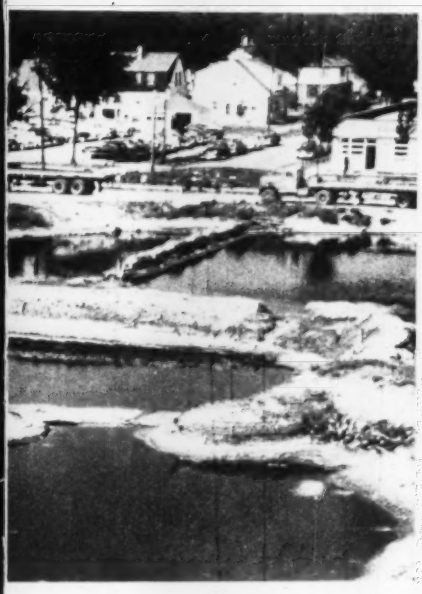
Finds a Way—Three A. O. Smith plants within a ½-mile radius in Milwaukee pickle 1 million tons of steel a year by batch processes. The company has developed a low capital investment method which is practical and economical for a disposal problem of that scale.

The process (patented and available to industry) makes use of a slurrying tank, a reaction tank, and a vacuum disc filter which are interconnected by pipelines. The principle is continuous neutralization and controlled oxidation of the liquor. A filter cake which can be used for land fill and a filtrate which can be discharged to the sewer are produced.

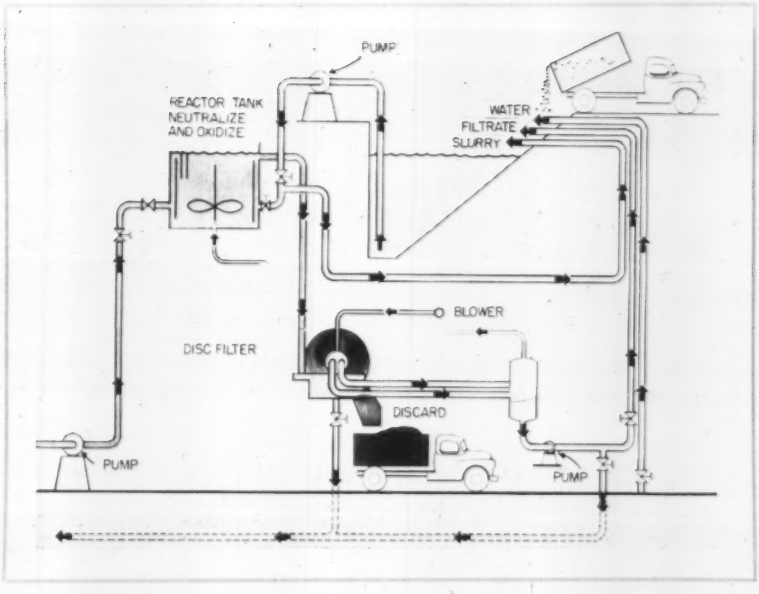
The Milwaukee plant has gone through considerable evolution since the initial installation was made in 1951. It is now able to treat at least 60,000 gallons of waste pickle liquor in 8 hours, producing 300 tons of filter cake. The company's waste output runs between 4 million and 6 million gallons a year, consisting of 2 to 5 per cent sulfuric acid and 25 per cent ferrous sulfate (dry basis).

Cost Is Reasonable—A duplicate plant could be built for less than $100,000. Operating and disposal costs, including plant depreciation, are consistently under 2 cents per gallon.

Trucking away the filter cake accounts for about half the total operating cost. The plant is operated by three men on a one-shift basis.



made valuable reclaimed land, now used for storage



The neutralizing agent will have some effect on costs. Milwaukee is in limestone country, so lime was first chosen (about 40 tons per day are needed). Then it developed that the local acetylene industry also had a disposal problem. Its byproduct carbide sludge, mostly calcium hydroxide, proved to be an ideal and cheap substitute for commercial lime.

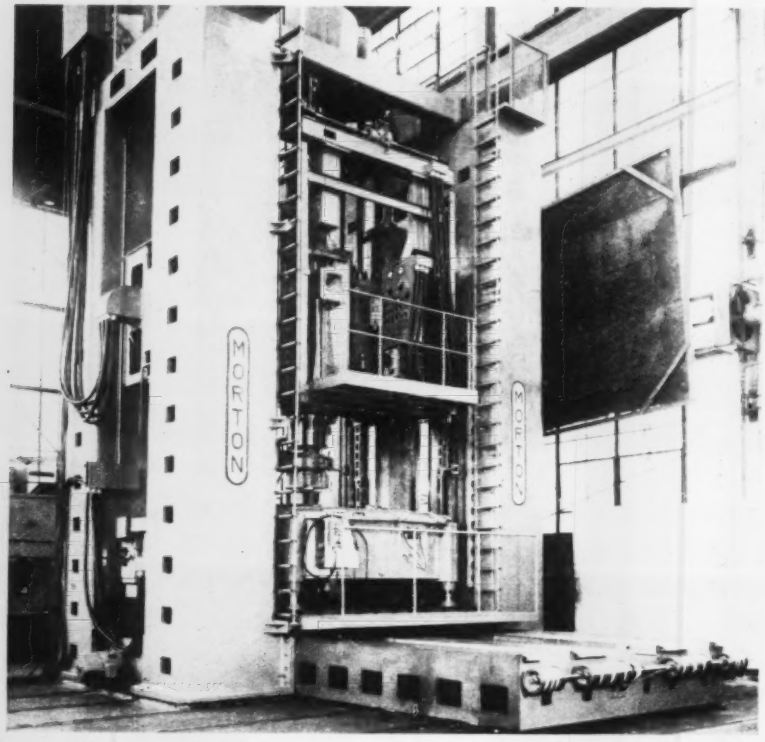
Step by Step — Byproduct lime (carbide sludge) is brought in by truck and dumped on the floor of a watertight room. The doors are closed and a stream of water-lime slurry is played on the dry lime, washing it into a concrete pit. About 40 tons of lime can be converted to milk of lime (2 to 2½ lb per gallon) in 30 minutes by this hydraulic method. Concentration is controlled by a ball float which sinks when no more lime is needed.

The slurry is pumped to an elevated cylindrical reactor tank (500 gallon) where it meets the pickle liquor pumped from a holding tank or lagoon. The mixture is agitated by a propeller rotating at 70 to 80 rpm. Compressed air injected at the same time oxidizes some of the ferrous hydroxide formed by the reaction to ferric hydroxide. A 2 to 5 per cent ferric hydroxide content is aimed for (it is obtained in a reaction time of less than 15 minutes). This mixture filters readily.

Overflow from the reactor tank moves by gravity pipeline to an Eimco, 400 sq-ft disc filter. A filter cake 1 to 2 in. thick gives the best production rate. It will compact well when dumped and is sufficiently permeable for the remaining water to pass out of it.

Useful Byproducts — The filter cake is discharged down a chute into trucks, which cart it to the old acid neutralizing lagoons. It makes good secondary fill, and the land reclaimed is used for storage and plant expansion. The liquid filtrate is discharged to the sewer or pumped into the limeroom to aid in making up the slurry.

The company has sponsored experiments using the filter cake (Ferrosul) as a soil amendment. Results are not conclusive, but light applications appear to aid plant growth, expecially in soils low in calcium, sulfur, or iron.



Operator watches cut on huge boring unit on TV as an . . .

Unusual Approach Pays Off

PRODUCTION men at GE's Large Steam Turbine-Generator Dept., Schenectady, N. Y., figure the most obvious answer to a machining problem isn't always the best one. They don't hesitate to try an unorthodox approach.

Example—A 40-ft high turning and boring machine will use TV, numerical control, visual guidance, and a "turning ring" that drives cutters around the periphery of stationary parts. In one setup, it will do the work that used to take three setups on three, 16-ft vertical boring mills.

GE's W. W. Kuyper says the machine will reduce the time for the cutting operations by more than 75 per cent.

The machine will work on high pressure sections for large steam turbines. Designed and built by Morton Mfg. Co., Muskegon Heights, Mich., it will take advantage of several unconventional features.

Departures — Parts, averaging roughly 8 ft in diameter and 8 ft high, are loaded on a shuttle table, then moved into the machine where they are located and clamped. A turning ring lowers over the part, is clamped to the column ways and supported on four "jack" columns that keep it parallel to the table and hold it at the right height for the turning cut. The rotating ring, driven by a 30-hp motor, carries two adjustable tool heads—each has its own motor and gear train for radial and vertical feed.

A TV camera, with its own light source, is mounted at the base of the boring head so the operator can watch the tool in the cut. The operator can use electronic numerical control to preposition the cutters; he can also steer the cutters deep in the workpiece interior by following full-size templates of the work contour and the tool bits.

New Hot Mill Rolls

Kaiser installation increases hot strip and plate production at Fontana, Calif., plant

AN 86-in. hot strip mill has gone into operation at Kaiser Steel Corp.'s Fontana, Calif., plant. It is housed in a half-mile-long building with eight acres under roof.

The installation includes three furnaces to preheat steel slabs for rolling, a scale breaker, and 11 roughing and finishing rolling stands arranged in tandem. All but the tandem finishing stands are new.

Frees Plate Mill—The new mill is one of the most important facilities in the company's current $214 million expansion program. It will make more hot-rolled sheets and strip available to western users, and will increase Kaiser's steel plate capacity.

The hot strip mill formerly was dependent on the plate mill for partially rolled slabs, and the new mill makes more rolling time available for plate production.

Besides the new furnaces, the mill includes a new scale breaker, a 136-in. broadside mill to widen slabs, and four 89-in. mills to lengthen slabs. These have been integrated with the plant's existing six stand, 86 in. finishing mill, which was moved from its previous location in the plate mill.

Capacity — The new mill can handle slabs measuring up to 6 ft wide and 22 ft long and weighing over 16 tons. However, the typical hot mill slab will weigh about 6 tons (4 in. by 40 in. by 22 ft) and will be rolled into a coiled tin mill hot band 1/16 in. thick, 40 in. wide, and more than a quarter of a mile long—in about 2 minutes.

The hot-rolled sheets and strip will be used in the manufacture of such products as truck bodies, tanks, drums, water heaters, pressure vessels, auto frames, and many other products made in the West. The hot strip mill will also produce semi-finished steel for tin plate and electricweld pipe.

NEW all-welded box frame construction

NEW heavier, more rigid tool guide post

NEW automatic tool welder

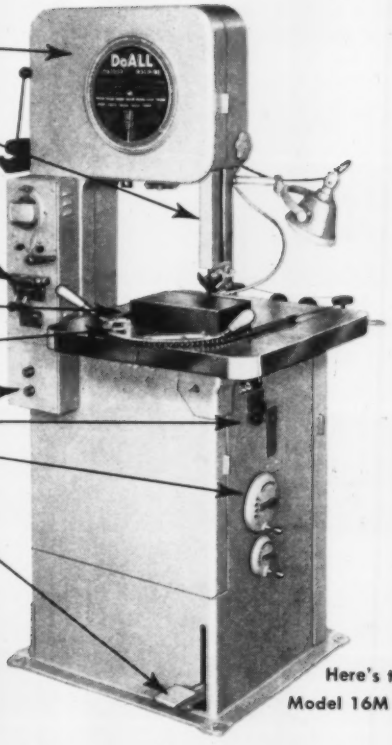
NEW heavy-duty drive—wide, stepless speed range

NEW precision-ground, non-glare, tilting table

NEW "job-tested" attachments

NEW easy-to-reach controls

NEW smooth, positive feed control



Here's the Model 16M (16")

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They're true multi-purpose machines—ideal for toolrooms, jobbing shops, sheet metal and maintenance shops. These new machines bring you the rigidity, power and operating ease that make DoALL the leader in the field.

With the Models 16M and 30M you are ready to handle a variety of assignments. In addition to sawing, the machines provide band filing, polishing, and friction cutting.

Entirely new, inside and out, these are modern, efficient, universal band machines. Variable-speed drive delivers smooth power for contour sawing of any machinable material. And accuracy is assured under even the heaviest cuts.

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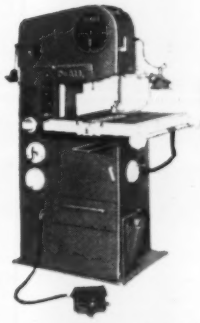
B-52



For high production DoALL offers its Contour-matics® teamed with Demon® HSS saw blades

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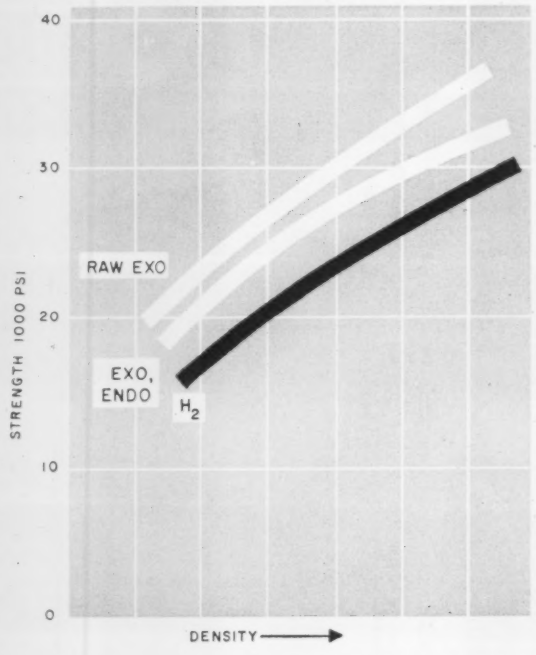
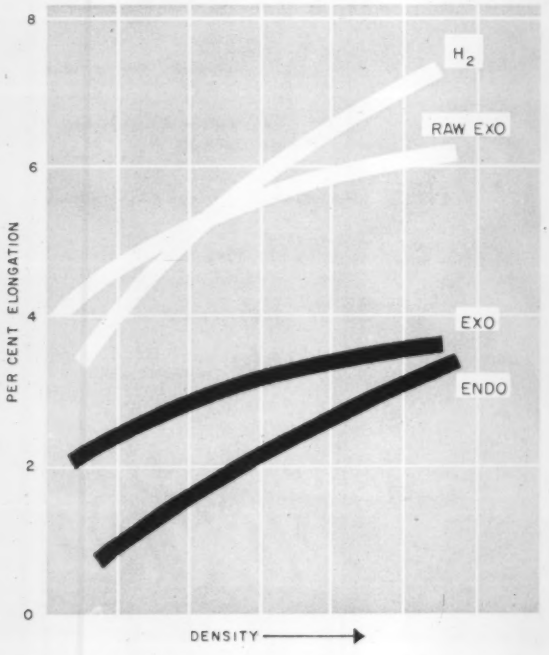
Carburizing Improves Strength



Highest strengths are obtained with a carburizing atmosphere. This is particularly true if the compacts contain graphite and have a high carbon potential

Decarburizing Ups Elongation



Decarburizing atmospheres improve the elongation characteristics of compacts. It is necessary to sacrifice strength to obtain good elongation

Pick Right Atmosphere To Sinter Iron

A KEY to successful and economical production of powder metallurgy parts is selection of the correct atmosphere to prevent oxidation at the sintering temperature. Cost is not the only factor to consider; you need to know about effects on strength, dimensional stability, and elongation.

Republic Steel Corp., Cleveland, studied effects of five atmospheres on compacts containing over 80 per cent iron. The gases were hydrogen, cracked ammonia, raw exothermic (raw exo), scrubbed and dried exothermic (exo), and endothermic (endo).

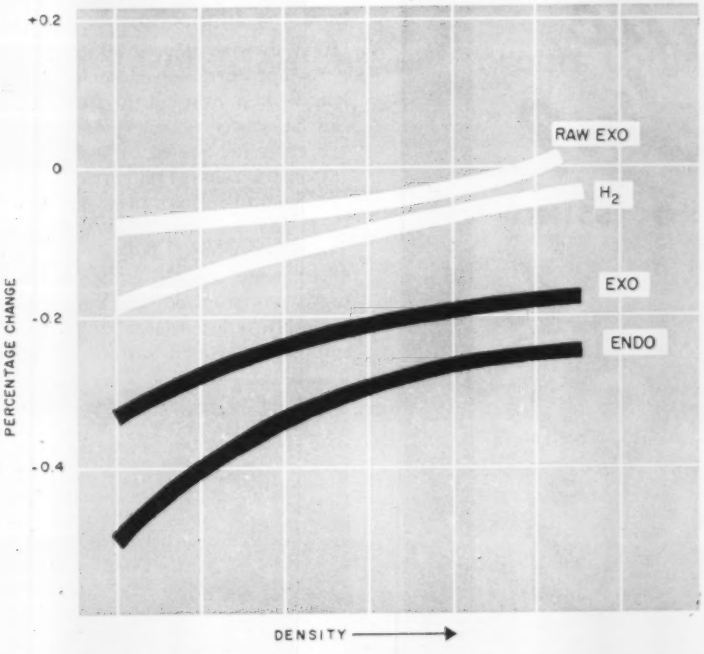
Example — The effect of atmosphere is dramatically shown by a hydrogen-reduced powder that takes to carbon readily. It contains 3 per cent copper and 1 per cent carbon.

At a sinter density of 0.22 lb per cu in., its strength is about 30,000 psi when sintered with hydrogen or raw exo. When sintered with exo or endo gas, its strength is about 70,000 psi.

Here is a rundown on the various properties of the five gases tested and their prices (based on 1000 standard cu ft):

Hydrogen, $10—Readily available in cylinders or trailers, this gas is best for reduction. Reducing

Carbon Affects Dimensions



Compacts without carbon will shrink more, or grow less during sintering with atmospheres of high carbon potential. The reverse is true if they include graphite

For best results, investigate the influence of various gases on strength, elongation, and size changes. For example, iron-carbon compacts can be made stronger

atmospheres are preferred since they minimize the oxide content of the compact. (Exceptions are cermets where oxides are desirable.)

A hydrogen atmosphere is excellent for straight iron and iron plus copper compacts. It is decarburizing, making it undesirable for parts containing carbon.

Cracked Ammonia, $2.28—This is an economical source of a hydrogen atmosphere. It contains only small traces of water vapor, reducing decarburization. If nitriding is a problem, it cannot be used in place of pure hydrogen unless extreme precautions are taken.

Raw Exo, $0.10—Exothermic gas is made by partially burning natural gas over a catalyst. Normally a 6 to 1 air ratio gives a composition of carbon dioxide, 6 per cent; carbon monoxide, 9; hydrogen, 15; water vapor, 2; and nitrogen, 68. The gas is one of the most economical for sintering. It is weakly reducing and highly decarburizing, making it unsuitable for high carbon compacts.

Enriched Exo, $0.20—Scrubbing carbon dioxide from raw exo and drying it to 0° to − 30° dew point makes it acceptable for high carbon parts. The gas is weakly reducing and carburizing.

Endo, $0.25—Endothermic atmospheres are made by cracking natural gas with a small amount of air over a heated catalyst. Composition: Carbon monoxide, 20 per cent; hydrogen, 40; nitrogen, 39; and traces of methane and water vapor.

The atmosphere carburizes straight iron parts causing them to lose their ductility. The gas is best for sintering iron-carbon compacts, because the carbon potential of the gas can be controlled by varying the dew point. Endo is a highly reducing atmosphere.

Sintering Controls Carbon—Copper is added to iron powders to increase the strength, impart machinability, and control dimensional changes (it forms tight bonds with iron). Its high cost has resulted in the use of iron and carbon alone. Sintering with the correct atmosphere can yield excellent strengths with iron-carbon sinters.

Republic's E. P. Kawasaki says the best way to handle iron-carbon mixes is to add the correct amount of carbon and then sinter in an endo atmosphere which has the same carbon potential.

Part of the carbon added to the iron will reduce the oxides and will be unavailable for chemically uniting with the iron to form cementite. Formula for carbon additions: ¾ of the hydrogen loss plus 0.85 per cent.

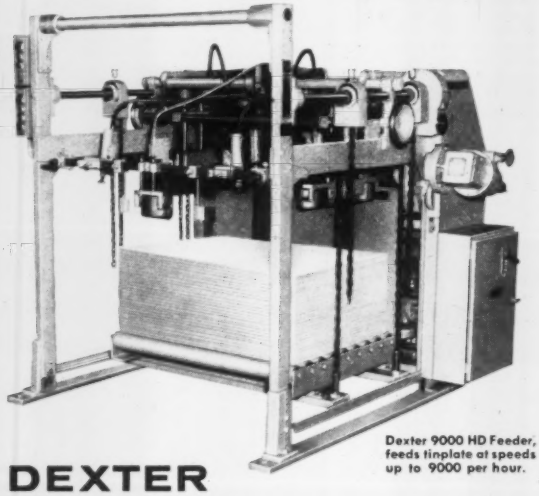
The physical properties are made less desirable when the carbon content exceeds the eutectoid composition. The excess of cementite in these compositions weakens and embrittles the sinterings.

A decarburizing atmosphere robs the parts of their carbon content. For example, a powder with 1.07 per cent carbon shows a strength of 50,000 psi with exo or endo gas atmospheres, but only 20,000 psi with hydrogen or raw exo.

• *An extra copy of this article is available until supply is exhausted. Write Editorial Service,* STEEL, *Penton Bldg., Cleveland 13, Ohio.*

Automatic Feeding

FOR SHEET METAL PROCESSING



Dexter 9000 HD Feeder, feeds tinplate at speeds up to 9000 per hour.

DEXTER

automatic **METAL** *sheet feeders*

Dexter Feeders are available in over a hundred different sizes, speeds and load capacities to suit individual requirements. Look at the wide range of the Dexter Line . . . sheet sizes from 14x14" to four by twelve feet . . . sheet thicknesses from .006 to .200 . . . load capacities from 6000 to 30,000 pounds . . . and speeds from 600 to 9000 sheets per hour! Certainly there's a model that will fit your operation, and without doubt, step up your production.

Dexter Automatic Feeders can be attached to many types of equipment . . . Metal Decorators, Coating Machines, Shears, Slitters, Punch Presses, and numerous others.

If sheet feeding is one of your production bottlenecks, give us the details. We'll be happy to tell you what we can (or can't) do for you.

Designers of sheet handling equipment for over 75 years

DEXTER **FOLDER COMPANY**

DIVISION OF MIEHLE-GOSS-DEXTER, INC.

219 East 44th Street, New York 17, New York

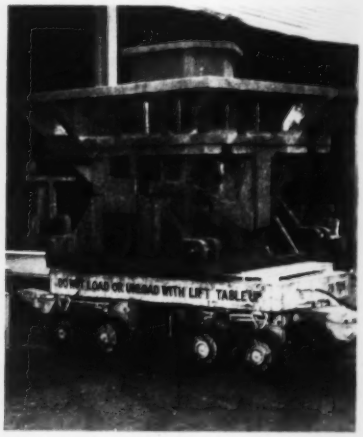
Handles Big Dies

Outdoor storage can be a problem for extra heavy ones. Here's how one firm solved it

HOW do you move a 40-ton die?

An auto firm solved such a problem with a heavy-duty trailer that can be easily maneuvered in storage areas not served by a crane.

Construction—The carrier (made by Salem-Brosius Inc., Carnegie, Pa.) has 16 wheels mounted on Timken bearings. It is 29 in. high, 48 in. wide, and 96 in. long. Steering is synchronized, and each wheel assembly is articulated to give load stability on rough surfaces.



SOLVED:
. . . one die handling problem

The trailer deck rests on four hydraulic cylinders which have a 3-in. stroke. The towing tractor powers the hydraulic system. Synchronous lifting is done with a flow equalizer that has one inlet and four outlets. Quick disconnect couplings make disengagement from the tractor easy.

The auto plant stores its dies on saddles so that the trailer can be backed up under them. When the hydraulic deck lifts the die free of the saddle, the tractor pulls the die off the storage rack. The deck is then lowered and the die delivered to the press area.

Types—Salem-Brosius makes such trailers in several sizes—the 40-ton is the largest.

Beds and frames are welded plates. No springs are needed since hydraulic cylinders provide a cushioning effect.

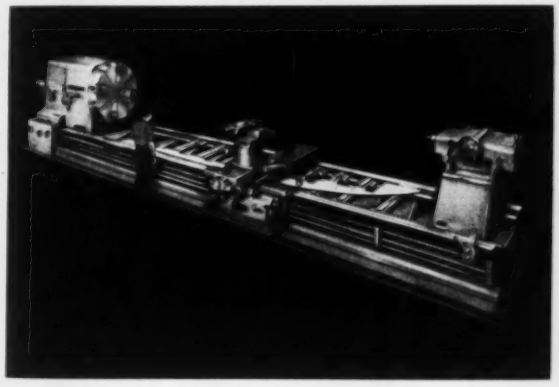
Operators says the devices are easy to maneuver.

Precision Lathe Contours Large Thin-Walled Workpiece

The Missile Master is designed for close tolerance contour turning, boring, and facing. It handles nose cones, nozzles, motor cases, bulkheads, airframe sections, and other large thin-walled pieces.

The lathe, featuring both face plate and direct spindle drive, offers a clearance diameter of 85 in., a swing over the cross slide of 67 in., and bed lengths up to 300 in. between centers. Contour control is supplied by a swiveling air-gage tracer system which can handle a template diameter variation of 35 in.

Since missile parts are thin walled and light, heavy stock removal is not required and the 25-hp motor furnished is adequate for recommended work. *Write*: Monarch Machine Tool Co., Sidney, Ohio. *Phone*: Hyacinth 2-4111



Budget Finishing Machine Has 1000-lb Workload

An economy series barrel finishing machine, Supersheen Model EB-3032, has a capacity of 13.8 cu ft or 1000 lb.

The unit is driven by a 1½-hp motor through a helical gear speed reducer which gives 97 per cent efficiency under full load. A variable speed control allows adjustment of rotation speed from 10 to 30 rpm. A positive magnetic brake and forwarding and reversing switch permit easy positioning of the barrel for loading.

Barrels are available unlined or with ¼ or ½ in. Neoprene lining. They are welded of heavy gage, cold rolled steel, rigidly gusseted, with extra rigidity from box and A-frame construction. The barrel is 30 in. in diameter and 32 in. long. *Write*: Almco, Queen Products Inc., Albert Lea, Minn. *Phone*: 3966

Large Capacity Electric Plant Offers Standby Power

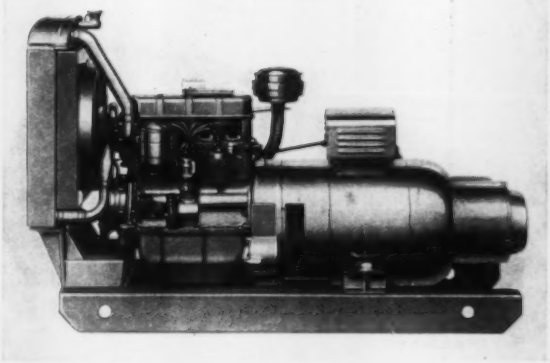
The Model 25R81 electric plant provides 25 kw, 120/208 volt alternating current and is equipped for remote starting.

Its generator is a 12 lead, reconnectable, revolving field type with direct connected exciter and automatic voltage regulation.

The gasoline engine develops 60.7 hp at 1800 rpm and its valve rotators and alloy steel exhaust valve seats insure long valve life.

Standard equipment includes skid base, vibro dampers, safety devices for low oil pressure and high water temperature, and oil and fuel filters.

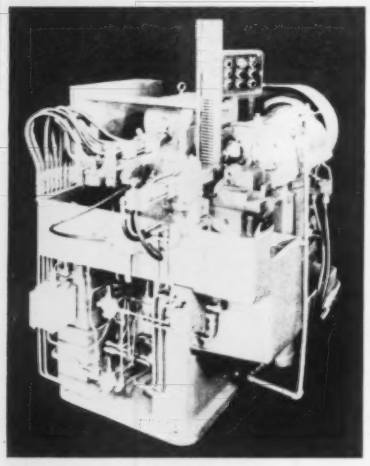
Weatherproof housing, city water cooling, and equipment for gas operation are available. *Write*: Kohler Co., 44 High St., Kohler, Wis. *Phone*: Glencourt 7-4441



NEW PRODUCTS and equipment

Cutter Life Increased

A hydraulic, tap flute milling machine has a compensating feed table which automatically slows for hard spots in the workpiece. It resumes preselected speed when the spot has been passed.



Tap sizes range from ½ through ¾ in. hand and gun type, ⅛ through ½ in. pipe type. The machine handles straight and tapered, 4, 3, and 2 flute models.

The hydraulic system is self-contained. *Write*: Kohler-Joa Corp., Sheboygan Falls, Wis. *Phone*: Howard 7-4674

Unit Rolls Threads

This is one of a series of thread rolling machines for heavy-duty production priced for small and medium plants.

The Shuster machines are the reciprocating die type and will roll threads, knurls, gimlet-pointed wood screws, and machine screws. Depending on the machine used, 2 or 3 in. lengths of thread may be rolled.

Four thread rollers are available—two are fed manually, and two by hopper. Rate of production is 60 to 120 pieces an hour. *Write*: Mettler Machine Tool Inc., Adeline Street, New Haven 11, Conn. *Phone*: Locust 2-3178

Economical Metal Testing

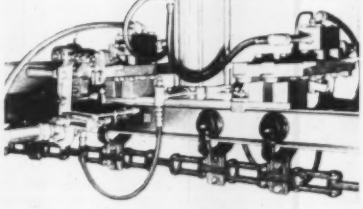
These radiography machines for the nondestructive testing of metals will inspect castings and weldments from ¼ in. to 1 ft steel.

Model 1060 Multitron with 1000 curies of cobalt 60 can do the work of a 2-million-volt x-ray machine at less cost. Units are compact and safe. *Write*: Nuclear Systems, Budd Co., 2450 Hunting Park Ave., Philadelphia 32, Pa. *Phone*: Baldwin 5-9100

Trolley Wheels Lubricated

An air actuated, automatic trolley wheel lubricator provides positive lubrication to every wheel on both sides of the track without stopping the production line.

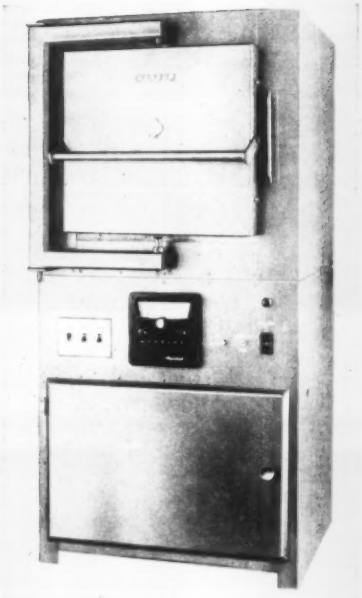
The unit may be easily installed on any existing overhead conveyor with a 3, 4, or 6 in. I-beam.



The unit's reservoir contains 25,000 shots of oil or grease—sufficient for about four miles of track, or enough to serve an average 1000-wheel system with once-a-week lubrication for a period of three months. *Write*: Alemite Div., Stewart-Warner Corp., 1826 Diversey Parkway, Chicago 14, Ill. *Phone*: Lakeview 5-6000

Furnace for Test Firing

The MR-18 is an electric furnace for test firing in the intermediate range. For 2000° F operating maximum, nichrome wound elements are used in Model MR-18C. Kanthal windings for 2300° F are used in Model MRH-18C.

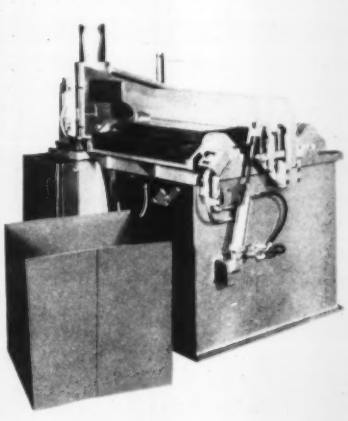


Both models provide setting spaces 18 x 18 x 19 in. and are wired for 220-volt single phase power. The MR-18C speed at 230 volts, loaded, is 5½ hours minimum from 70 to 1800° F. *Write*: Harrop Electric Furnace Div., Harrop Ceramic Service Co., 3470 E. Fifth Ave., Columbus 19, Ohio. *Phone*: Belmont 1-3621

Bends Small Workpieces

The Model 6 ASW 2 machine is an open end, single wing tangent bender designed for products less than 6 in. wide, such as tubing, angles, and channels.

It requires no front clamping mechanism and has a rapid operation cycle. Other air-operated ma-

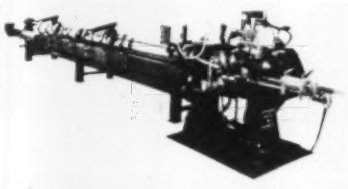


chines in the series include the conventional single wing, the duplex, and the quadruplex tangent benders which will handle material from 24 to 48 in. wide. *Write*: Taylor-Winfield Corp., Warren, Ohio. *Phone*: 2252-1

Cutoff Feeds Pipe

Two to four of these rotary pipe and tube cutoff machines can be operated simultaneously with one attendant.

The rack can be loaded with 15 to 25 lengths of pipe up to 21 ft long. The machine will automatically feed and cut the pipe to predetermined lengths, and adjustments can be quickly made for cutting pipe from $\frac{7}{8}$ to $3\frac{1}{2}$ in. OD.



The automatic feed section is available in models to fit cutoff machines other than Continental. *Write*: Continental Machine Co., 2345 W. Nelson St., Chicago 18, Ill. *Phone*: Eastgate 7-8831

Pump Heats Liquid

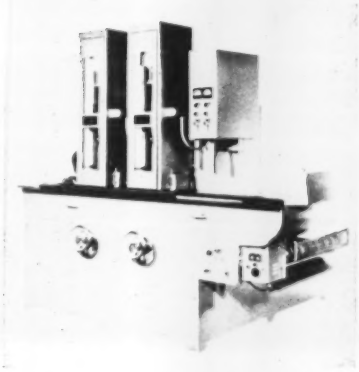
For the pumping of liquids that congeal, solidify, or crystallize with loss of heat, these standard constant temperature pumps transfer heat to the liquid as it is pumped.

Phthallic anhydride, sulfur, ammonium nitrate, rosin, urea, waxes, tars, heavy petroleum, and some fatty acids can be handled. *Write*: Dean Bros. Pumps Inc., 323 W. Tenth St., Indianapolis, Ind. *Phone*: Melrose 4-6401

Unit Has Multiple Heads

The Model 696 precision abrasive belt grinder permits two or more high speed grinding and finishing operations in the time formerly required for a single operation.

Unmachined surfaces, ground on a series of progressively finer-grit abrasive belts, can be given a fine

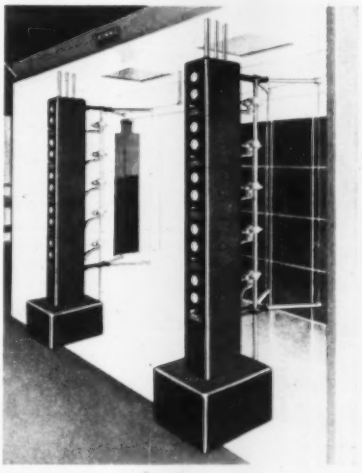


polish to exacting tolerances in one continuous finishing pass.

This machine, available with two to six (or more) individually adjustable grinding heads, offers extensive capacity. It will handle parts up to $5\frac{1}{2}$ in. maximum width and $6\frac{1}{2}$ in. maximum thickness. *Write*: Engleberg Inc., 831 W. Fayette St., Syracuse 4, N. Y.

Spray Units Are Flexible

Electrostatic spray painting is applicable to metallic products that can be handled on overhead conveyors or base mounted conveyorized spindles. The system greatly reduces overspray and lowers finishing costs.

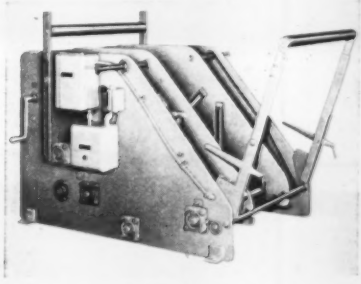


This equipment is housed in modular, self-contained packages which may be stacked and clamped one on the other, depending on product measurement—or variety of shape. All parts are standardized. The system operates on 100,000 volts at 5 milliamperes maximum. *Write*: Binks Mfg. Co., 3122 Carroll Ave., Chicago, Ill. *Phone*: Van Buren 6-4200

Coil Cradle Improved

Redesigned Koil Kradles have improved width capacity between guide plates, and over-all outside dimensions have been reduced.

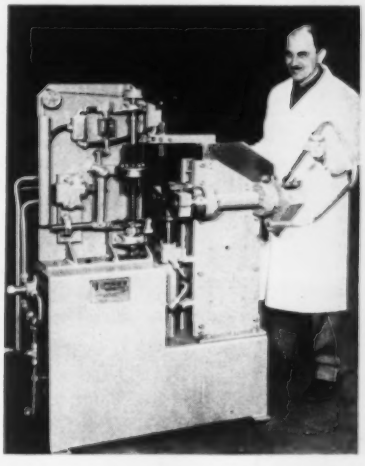
Side plates are joined in a rigid, welded structure with heavy wall tubes as transverse members. The tubular construction eliminates racking and torsional deflection of the frame—retaining bearing alignment.



These 700 Series units are available in coil weights up to 20,000 lb and in coil widths to 50 in. *Write*: Benchmaster Mfg. Co., 1835 W. Rosecrans Ave., Gardena, Calif. *Phone*: Faculty 1-0411

Press Bends Ten Angles

A 3-ton progressive bending press makes up to ten bends of varying degrees. It is done one bend at a time in a single piece of material without the use of internal mandrels and without excessive flattening or distortion.



The press will handle up to 1 in. OD, 14 gage steel tubing. It is capable of 1000 to 1500 bends an hour. *Write*: Pines Engineering Co. Inc., 601 Walnut St., Aurora, Ill. *Phone*: 6-7701

NEW literature

Write directly to the company for a copy

Heat Resistant Alloy

Engineers and those associated with the design and operation of steam generating equipment will be interested in Bulletin TR-555, "Croloy 15-15N, an Austenitic Heat Resistant Alloy for Severe Tubular Applications at Elevated Temperatures." Babcock & Wilcox Co., Beaver Falls, Pa.

Dial Indicators

Catalog D describes the expanded line of Em-re dial indicators. Covered also are the Golden Em-re dial indicators, service kits, an indicator checker, and indicator accessories. Petz-Emery Inc., Pleasant Valley, N. Y.

Overhead Conveyor

Catalog CDA describes the American Cable-Way overhead conveyor. Information is complete enough to engineer a conveyor of any size. Conveyor Div., American MonoRail Co., Fourth and Franklin Streets, Tipp City, Ohio.

Paint Stripping

"How To Strip Paint" describes four methods used commonly by leading industrial plants and discusses 12 paint stripping compounds. Treatment of metals before repainting and prevention of rust on stripped surfaces in storage are covered. Oakite Products Inc., 134E Rector St., New York 6, N. Y.

Steel Pipe

A 17 x 22 in. wall chart shows essential pipe specifications on wall thickness, weight, and outside diameter of seamless and welded steel pipe under ASA schedules from ⅛ to 24 in. Midcontinent Tube Service Inc., 2120 Lee St., Evanston, Ill.

Steel Tubing

"Mechanical Steel Tubing" gives detailed specification charts on size range, wall thicknesses, approximate weights, standard mandrel bends, and standard 90-degree bends without mandrels. Dept. MST, Rome Cable Corp., Torrance, Calif.

Electrical Insulation

"Nepcozone Insulation for Wire and Cable" contains an analysis of the chemical structure of Butyl insulation and a description of the manufacturing processes perfected by this company. This insulating material is designed for high voltage power cables in underground ducts, conduits, and exposed applications. Advertising Dept., National Electric Products Corp., 2 Gateway Center, Pittsburgh, Pa.

Welding Flux

The three jobs of metal-joining flux are explained in the Complete Flux Issue, TIS 2839, of the Technical Information Digest. The importance of removing surface oxides, providing full wetting action, protecting the molten filler metal, and minimizing and controlling welding heat input is covered. Eutectic Welding Alloys Corp., 40-40 172nd St., Flushing 58, N. Y.

Drainage Problems

"Solving Drainage Problems," a 76-page brochure, contains descriptive data for the evaluation of flow friction that will greatly simplify planning and design. Publications Dept., Bethlehem Steel Co., Bethlehem, Pa.

Light-Wall Tubing

Bulletin No. 60 describes ThinWeld tubing produced from more than 80 metals in sizes from ½ to 9 in. in diameter with wall thicknesses from 0.002 to 0.049 in. maximum. Western Pneumatic Tube Co., P. O. Box 4104, Kirkland, Wash.

Protected Motors

Bulletin GEA-6721 describes weather-protected motors, available from 250 hp up. General Electric Co., Schenectady 5, N. Y.

Sling Chains

The complete line of Acco registered sling chains is described in a 28-page catalog, DH-105. Listed are such points as: Ordering information, safety factors to consider, specifications, care, and a table of wear and inspection procedures. American Chain Div., American Chain & Cable Co. Inc., York, Pa.

Tube-Type Motors

Bulletin 51B8991 describes the redesigned line of TEFC tube-type motors with capsule mounted, split sleeve bearings. It portrays the motor's tube-type air to air heat exchanger system. Allis-Chalmers Mfg. Co., Milwaukee 1, Wis.

Heat Diffuser

Catalog 46 AF 91 describes direct fired heat diffusers and the various installations in which the units are featured as a low cost central system for factories, warehouses, and other large area buildings. Unit Heater Dept., Carrier Corp., 300 S. Geddes St., Syracuse 1, N. Y.

Diecasting Machines

Bulletin 23.10 covers toggle-type diecasting machines in sizes from 650 to 2000 tons clamping capacity. Lake Erie Machinery Corp., Box 68, Kenmore Station, Buffalo 17, N. Y.

Hot Spray Finishing

A 28-page booklet explains the theory of the hot spray process and presents case histories of results obtained in metalworking. Spee-Flo Co., 6614 Harrisburg Blvd., Houston 11, Tex.

Dry Lubricants

A booklet, "The Metalflo Series," describes dry lubricants for ferrous and nonferrous metallic powders. Metal Processing Div., Nopco Chemical Co., Harrison, N. J.

NEW BOOKS

Aids to Efficient Machine Design, Lincoln Electric Co., 22801 St. Clair Ave., Cleveland 17, Ohio. 96 pages, $1.00

The information in this manual is intended to promote the efficient use of welded steel design. Techniques, charts, nomographs, and data are given for redesigning from a casting or designing from calculated loads. The information has been developed to meet the needs of designers, evidenced at seminars conducted at Lincoln Electric Co.

Thermal Properties of Thirteen Metals, Special Technical Publication No. 227, American Society for Testing Materials, 1916 Race St., Philadelphia 3, Pa. 30 pages, $1.25

Today's technological developments present many heat transfer problems involving the utilization of thermal properties. Of present concern are: Thermal conductivity, thermal expansion, specific heat, and density. Thermal diffusivity may be calculated from the known values of thermal conductivity, specific heat, and density. Extensive data are supplied for two grades of aluminum, chromium, copper, two grades of Inconel, magnesium, molybdenum, Monel K, and four grades of steel.

Modelmaking for Industrial Design, Ralph R. Knoblaugh, Harper Landell & Associates, McGraw-Hill Book Information Service, 327 W. 41st St., New York 36, N. Y. 275 pages, 287 illustrations, $9.75

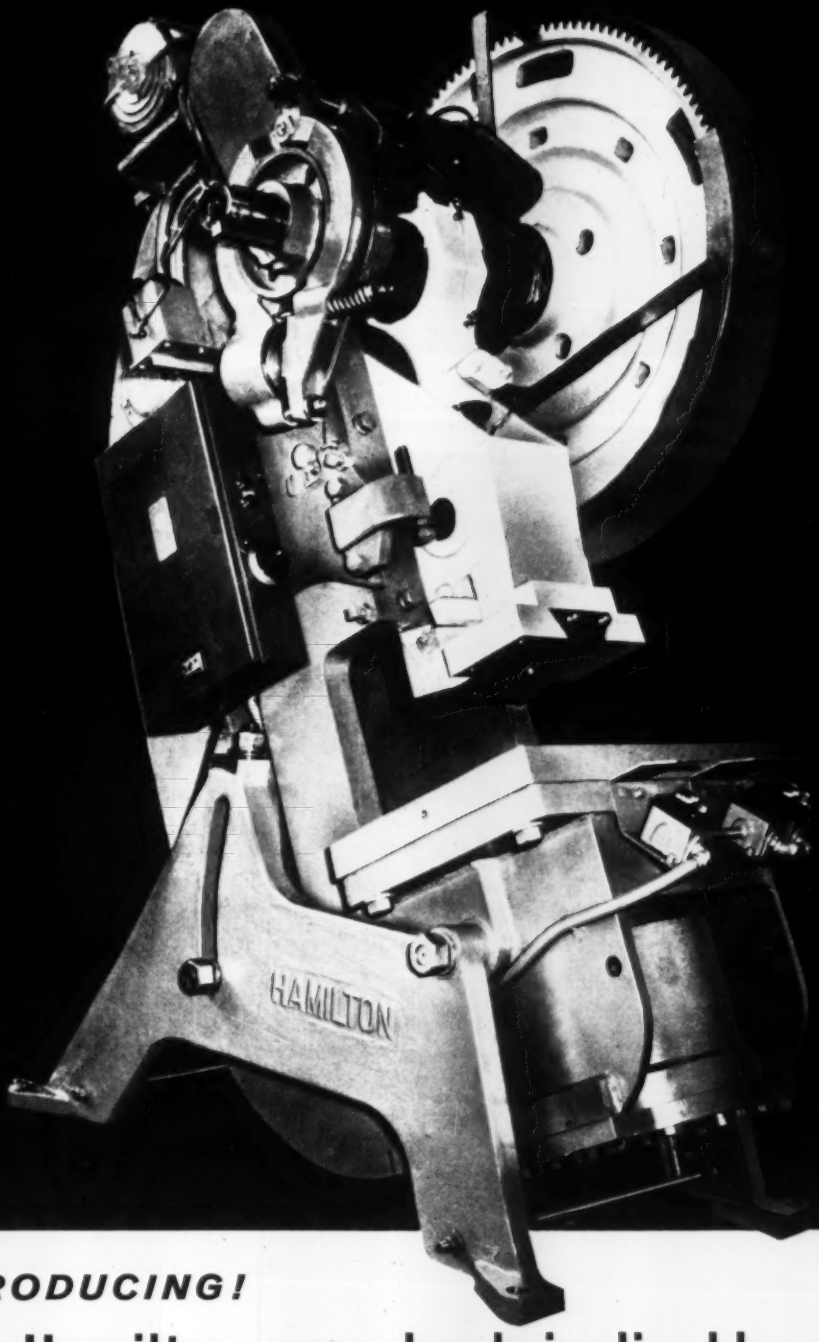
How-to-do-it instructions duplicate for the reader the experience of building models to meet requirements of designers and their clients. Basic techniques needed to produce models or parts in full size or to scale are shown.

Effects of Radiation on Materials, Harwood, Hausner, Morse, and Rauch, Reinhold Publishing Corp., 430 Park Ave., New York 22, N. Y. 355 pages, $10.50

The changes that radiation produces in metals, ceramics, plastics, and a variety of other materials are thoroughly covered in this book. It contains the papers delivered at the radiation effects colloquium jointly sponsored by the Office of Naval Research and Martin Co. at Johns Hopkins University. Twelve authorities analyze the results of their own experiments with various materials. The volume includes current concepts of radiation effects and discusses experimental approaches to radiation studies. An extensive bibliography is included.

Recommended Safe Practices for Inert-Gas Metal-Arc Welding, American Welding Society, 33 W. 39th St., New York 18, N. Y. $1.00

This report is based on laboratory studies, the experience of industry to date, and an extensive review of the literature and industrial records. All known potential hazards peculiar to the process are covered.



INTRODUCING!

New Hamilton open-back inclinable presses

Special features of Hamilton OBI Presses include stress-relieved welded steel design — lowers deflection so that up to 50% more stampings can be produced before dies require regrinding; disc-type air clutch, mounted on the crankshaft, to permit low-inertia starting with reduced heat generation; special air-released, spring-actuated brake for maximum efficiency and production speed with low heat loss; extreme stability and wearing qualities made possible by a wrist pin and crosshead type connection.

Write to Dept. 1-G for Bulletin 13302

Hamilton Division Hamilton, Ohio

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Diesel engines • Mechanical and hydraulic presses • Can making machinery • Machine tools

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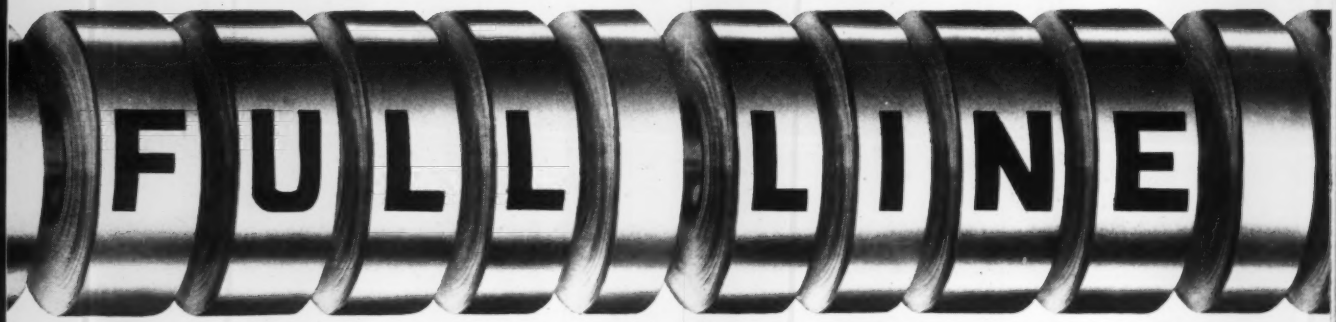
from J&L STRIP STEEL DIVISION

restricted and standard specification cold rolled strip steel



Let's examine this "Full Line" product list of cold rolled strip steel. At J&L it includes all carbon grades, coated and uncoated, alloy, stainless and tempered spring steel. It offers all thicknesses from .001" or less to .156" or more, in widths from ¼" to 24"—and tolerances for gauge and width closer than standard when required. There are "Full Line" advantages, too, in a range of controlled tempers and structures possible only with the variety of annealing, heat treating and rolling processes found at J&L.

Your "Full Line" benefits can start by specifying J&L because only J&L makes standard and restricted specification cold rolled strip steel in such a wide range of analyses, grades and sizes to accurately meet the most exacting need.

For Strip Steel, call the Strip Steel Specialist — J&L.

J&L STRIP STEEL DIVISION produces a full line of restricted and standard specification strip steel in these grades and types:

- Low Carbon
- High Carbon
- Tempered Spring Steel
- Molten Zinc Coated (Jalzinc)
- Electrolytic Zinc, Tin, Copper and Brass Coated
- Alloy
- Stainless
- Painted

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FORMERLY THE COLD METAL PRODUCTS COMPANY

Market Outlook

Automotive Buying Spurs Recovery

STEEL DEMAND is rebounding, aided mostly by automotive orders and to a lesser degree by the Mideast crisis.

Initial releases from Detroit have been no bigger than last year's (4000 to 5000 tons), but they're more than welcome. Chrysler Corp. and the Fisher Body, Buick, Oldsmobile, and Pontiac divisions of General Motors Corp. are buying. Ford Motor Co. will start ordering soon. About 20 per cent of the tonnage is for August delivery, the rest for September.

As they shake loose some substantial orders for cold-rolled sheets, bars, and stainless strip, automakers will also issue release dates to their part suppliers. The venders will soon be ordering steel for frames, springs, and stampings.

CRISIS NOT A FACTOR— Although it flared up a few days before automakers began ordering steel, the Mideast trouble had nothing to do with the carbuilders' buying. They were influenced solely by conditions in their industry—low steel stocks and a desire to get started on '59 models.

INVENTORY BUILDUPS COMING?— Barring a world war, it's unlikely that steel will be hard to get in the near future. But fear of a shortage may cause some consumers to step up their ordering. Those who've allowed their stocks to dwindle won't be quite so confident of immediate deliveries from mills and service centers (warehouses). Possible result: Widespread reversal of inventory policy.

PENTAGON STANDS PAT— After all the talk about our dependence on superweapons that use relatively little steel (missiles, A-bombs), U. S. Marines moved into Lebanon with landing craft, howitzers, and rifles. It seems clear that localized skirmishes will be fought with conventional arms.

The Pentagon says it plans no speedup in any kind of buying at the moment, but bigger defense budgets are in the cards.

DRUMMAKER REACTS— In one case, at least, increased demand for steel could be traced directly to the Mideast situation. An oil drum manufacturer who had been restricting his sheet supplier to shipments of a few carloads a month announced that he wanted all his orders delivered at once. He guessed that more drums would be needed to airlift oil to our beleaguered allies.

OIL COUNTRY OUTLOOK— Prospects for recovery in oil country goods are enhanced by two factors: 1. Arabs may cut oil pipelines, necessitating increases in American, Canadian, and Venezuelan production to supply Europe. 2. The Texas Railroad Commission raised the limit on producing days from 9 to 11 a month, starting in August. Texas bankers are revising their policies. They'll lend more money to drilling contractors.

NEEDED: HIGHER PRICES— As they release their second quarter earnings, steelmakers continue to stress the need for higher prices. J. L. Mauthe, chairman of Youngstown Sheet & Tube Co., views the profit squeeze resulting from employment cost increases as the industry's biggest problem. E. J. Hanley, president of Allegheny Ludlum Steel Corp., says it's "imperative" that some adjustment in steel prices be made in the "not too distant future." Most observers think U. S. Steel Corp. is waiting for a stronger market before announcing increases. The unexpected events in the Mideast could speed the price decision.

PRODUCTION GAINS— Last week, steelmaking continued its steady recovery from the July 4 setback. Furnaces were operated at 56 per cent of capacity, up half a point. Production was about 1,512,000 net tons of steel for ingots and castings.

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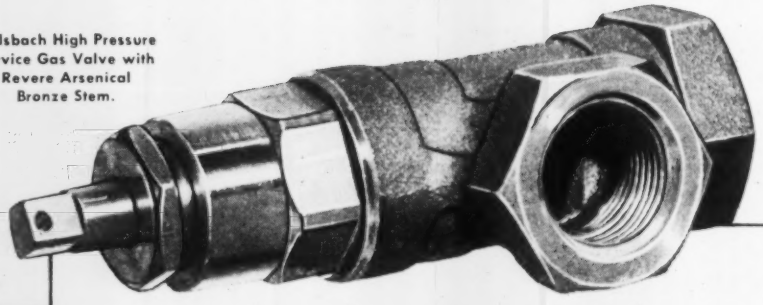

Welsbach High Pressure Service Gas Valve with Revere Arsenical Bronze Stem.

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In the manufacture of valves the Kitson Division of The Welsbach Corporation, Philadelphia, Pa., has to deep-drill brass rod. Originally the rod was free-machining brass. However, when Revere discovered the extent of the drilling it was suggested that our Mixture 252, Deep-Drilling Brass, would be preferable. This was tried, and the machine shop foreman reported that tool life was increased over 200%. In one item it is possible to bore with a single operation, against the former practice of withdrawing the drill three times in order to clear the chips. Revere's Deep-Drilling brass produces very small, easily cleared chips.

Another item is a high pressure gas valve, with a cast body and brass rod stem. The rod was changed to arsenical bronze, which costs a bit more, but it ended flaking and galling between stem and seat, and materially reduced rejects. Still another instance of Revere service concerns a hot water heater relief valve. The original model was cut out of bar stock. We suggested a high leaded brass tube, hexagon outside, round inside. This greatly reduces machining, has a better surface, and a better seat. Costs more by the pound, but saves more by the piece.

Revere salesmen and Technical Advisors are always glad to collaborate in seeking ways to save money and improve products. Perhaps we can help you!

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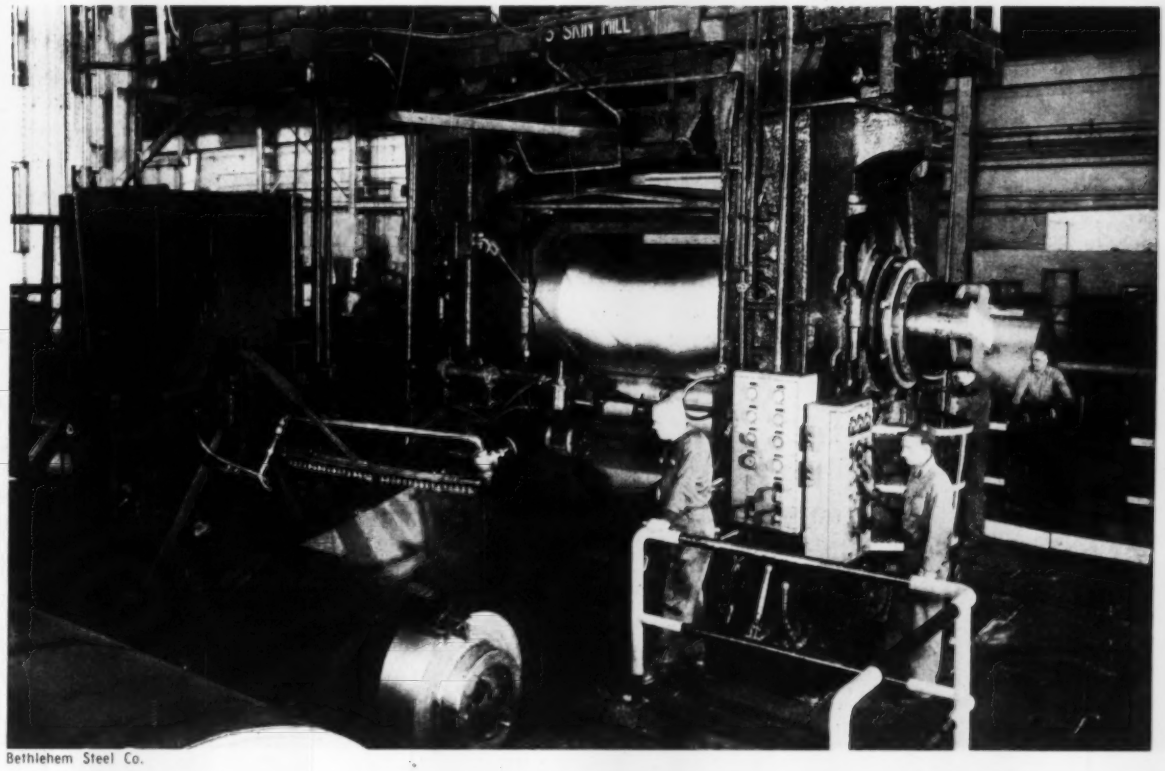

Bethlehem Steel Co.

More and more sheets like these are heading for Detroit as . . .

Automakers Begin '59 Steel Buying

DETROIT has started to order steel for its 1959 model runs. First deliveries are scheduled for late August and early September. The shipments are expected to move flat-rolled inventories of automakers to 20-25 days instead of the present 12-15. Initial tonnages will be used to fill depleted dealer pipelines.

Several mills expect to operate at 80 per cent of capacity by the end of September due to the automakers' demands and prospects of more metalworking demand stemming from the Mideast crisis. Detroit didn't place steel orders because of the Lebanon flareup, but the industry hopes the Mideast tension will spark more buying when new models appear.

What's Selling—Most of the auto orders are for cold-rolled sheets and cold-finished bars. GM's Fisher Body Div. is doing most of the buying. Its purchasing department coyly admits it is ordering for "normal production needs." GM's Buick-Oldsmobile-Pontiac plants also are placing sheet and bar orders.

Chrysler Corp. has requested mid-August delivery of bars for its suspension systems and reportedly has placed large orders for cold-rolled sheets. The bulk of stainless orders probably won't hit until August. There's little action from Ford Motor Co. divisions, but purchasing agents indicate they'll have volume orders out soon. Ford is scheduling model introductions later than the rest of the industry, so it won't need steel as quickly.

Who's Buying — As of July 14, suppliers of auto parts hadn't entered the market, mills report. Most venders have had commitments from the auto companies for months, but, with the exception of pilot steel until they get definite releases runs, they have held off buying on parts. Now that the big boys are ordering, mills expect suppliers to come trailing in.

While tonnages aren't up to 1955 and 1956 levels, and in many cases are below last year's initial orders, the mills report they are considerably above the volume of the last six months. Previous auto buying has been restricted to pilot run orders of 10 to 20 tons. Now several cold-rolled sheet orders of 3000 to 4000 tons have been noted. One producer claims his August tonnages will be 40 per cent of the maximum volume he expects from Detroit. He also predicts that it will be 70 per cent of maximum volume in September.

No Landslide — Steelmen seem pleased that huge orders aren't coming in. Says one salesman: "Last year we got some pretty fantastic

orders at the beginning of the 1958 model run buildup, but a lot of them were canceled in November when the car market fell apart. Orders this year appear to be more realistic, so there's less likelihood of cancellations."

This order pattern reflects automakers' plans for a cautious start in 1959, although the industry has scheduled a near-record 1.4 million production rate for the last quarter. There is little doubt that dealer stocks of 1958 cars will be under 250,000 by the end of September, and that's one reason for the higher fourth quarter scheduling.

Still Cautious—The reluctance of car builders to dash into 1959 model production stems from uncertainty about the signing of UAW contracts and because carmakers still aren't sure how the new models will be received.

The UAW is expected to sign a contract soon (see Page 33), and it is believed that buyers will like the considerably changed 1959 cars. If so, mills can expect fourth quarter shipments to increase as Detroit builds steel inventories back to their traditional 30-day level.

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Sheets, Strip . . .

Sheet & Strip Prices, Pages 102 & 103

Automotive sheet specifications are heavier, pointing to larger shipments in August and September. Miscellaneous demand is also expanding; July sales are running better than had been expected. Galvanized sheets are leading, with the bulk of tonnage going for agricultural uses.

More active auto business may spark a general revival in the sheet market. The auto builders are indicating what their September needs will be, but they haven't signed contracts.

Influences—The auto builders are apparently being influenced more by conditions in their own industry (low steel inventories and a desire to get going on '59 model runs) than by external considerations, such as the Middle East crisis.

July shipments of Pittsburgh mills are 10 to 20 per cent behind June levels, but they are above predictions. One area producer has booked sufficient August delivery tonnage to insure beating its July total.

Among the fairly active outlets for sheets are: Stoves, air conditioning equipment, commercial refrigeration, sanitaryware, fuel oil tanks, drums, door bucks, and office furniture. Specifications from these consuming lines include enameling stock, as well as hot and cold rolled and galvanized sheets.

Sluggish—Practically no new demands are coming from the railroads. Steel service centers are holding their orders to a minimum. Poor specifications for fractional horsepower motors and small transformers are holding down demand for silicon sheets.

While some types of appliances are selling more actively, demand for sheets from the appliance makers is not increasing. Also, there is no sign of new hedge buying, though most consumers anticipate a price increase before summer's end. In view of the Middle East crisis, and the likely price hike, it's thought August bookings may spurt substantially above July's.

Deliveries—Indicative of the relatively easy steel supply, Inland Steel quotes one to two week delivery on universal mill plates; two to three weeks on wide plates, floor

plates, hot-rolled sheets and strip; three to four weeks on cold-rolled sheets and strip, enameling sheets, and electrical sheets; August on tin plate, black plate, and blue plate; late August, early September, on galvanized sheets; two to four weeks on rail steel bars, shapes, and bands.

Cuts Hose Assembly Price

A reduction in the price of Fluoroflex-T (Teflon) flanged hose assemblies is announced by Resistoflex Corp., Roseland, N. J. It comes to about 20 per cent in all sizes.

Plates . . .

Plate Prices, Page 101

While over-all steel product demand is running slightly ahead of expectations, this is not the case with plates. Some producers of sheared plates note little improvement in buying over recent weeks. They say if it hadn't been for a good volume of construction work, demand would scarely have been sustained.

Platemakers look for a general lag over the rest of the summer, with sheared carbon plates available for shipment within two weeks and alloy plates in four to five weeks. A Chicago producer is receiving numerous inquiries, but few orders. The better inquiry ties in with quickening activity in the petroleum industry because of the situation in the Middle East. Inland Steel can deliver universal mill plates in one to two weeks, wide plates and floor plates, two to three weeks.

One Pittsburgh mill says its July entries will be about 80 per cent of June's. Construction is providing the best demand. Shipbuilding requirements are substantial, but fewer barges are being built. Railroad business is extremely slow, but plate shipments to pipe fabricators are holding up surprisingly well.

Fear of what may happen in the Middle East could be more of a stimulus to hedging than fear of a price increase, some producers think.

Bethlehem Steel is closing down its Staten Island (N. Y.) shipyard due to lack of work. The final job, a 286-ft dock barge (Texas tower type), was delivered July 10. The yard's four shipways have been empty since June 20, and ship repair operations will end Dec. 31.

Tubular Goods . . .

Tubular Goods Prices, Page 105

The Mideast crisis may result in a stepup in domestic oil production, leading to more well drilling and a rise in demand for oil country goods.

Oil country business continued to deteriorate in the first half of July. Rotary rigs in operation in the first two weeks in the U. S. and Canada fell from 2002 to 1946.

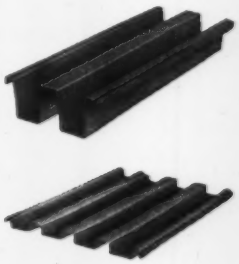
Tubemakers are hoping for a reversal of the drilling trend now that the Texas Railroad Commission has upped the limit on oil producing days from 9 to 11 a month, effective in August. The oil allowable for that month is pegged at 2,796,760 barrels.

One Pittsburgh area tubemaker reports line pipe sales are running slightly ahead of those a month ago.

Sales of seamless and miscellaneous pipe are holding at the June level. But buttweld pipe volume is down. One Pittsburgh producer says hedge buying helped him to book 85 per cent of June capacity.

It's thought some tubular goods

Steel Roof Decks and Flooring cold rolled up to 200 f.p.m. on this mammoth



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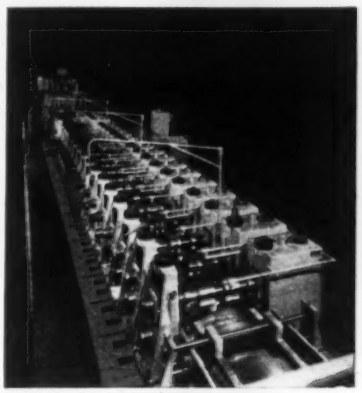

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buyers are delaying purchases until next month when a 3 per cent railroad freight tax expires.

Seattle has placed 388 tons of cast iron pipe and an award of 250 additional is pending. Eugene, Oreg., plans a water system requiring 13,000 ft of 30-in. steel pipe.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 101

Reinforcing steel bar demand is active, reflecting a continued upswing in building and construction requirements. Highway and other public work are taking substantial tonnages. Reflecting the strong demand, one eastern mill is operating three shifts.

Bar mills in the Pacific Northwest are not as active as thv were in June, largely because of vacation suspensions. Highway construction, including federal projects, continue to furnish a strong demand for bars in the area.

Steel Bars . . .

Bar Prices, Page 101

Of all the major steel products, commercial bars are in slowest demand. Machinery, railroad, and heavy industrial equipment needs are light. But a stir in auto steel requirements (chiefly for sheets) mav spread to bars.

Ability to obtain quick deliveries is influencing buyers to hold stocks to a minimum. Both hot and cold carbon bars in the popular sizes can be had within a week to ten days; alloy bars can be obtained in three to four weeks in most cases.

Cold finishers, fastener manufacturers, and warehouses hold substantial stocks of hot bars and are buying only to fill supply gaps. Railroad specifications are practically nil, while demand from manufacturers of tools and special industrial equipment is spotty.

Having experienced a 12 per cent jump in sales during June, a Pittsburgh area producer of cold-finished bars looks for a sharp decline this month. During the last three weeks, this producer booked some rush orders from screw machine products makers turning out parts for the '59 model automobiles.

Defense contracts (for carbon and alloy) have perked up demand slightly in New England.

There is more equalization of freight on bars than on other steel products, and with supply in excess of demand, competition for orders is intense.

A midwestern producer of cold finished has booked a good-sized order for August delivery.

The farm implement industry continues to provide fair demand, and expectations are it will continue to place business steadily the rest of the year. Equipment sales are at least 5 per cent ahead of last year's.

Distributors . . .

Prices, Page 106

Business booked by distributors has gained slightly this month because vacation suspensions at metalworking shops are on the decline. Total bookings for the month will probably fall under those for June when considerable price hedging was done. No marked upturn in sales is expected before Labor Day.

Inventories at steel service centers are adequate and well balanced. Mills expect orders from them to consist chiefly of replacement business.

Price cutting is still an important market factor in several districts. In the Pittsburgh area, established firms say it is being done by brokers who operate from one-room offices, have no regular sales force, buy obsolete stocks, and store their merchandise in open yards. "The trade's more receptive to these people today," a service center owner complains. "Buyers don't worry about quality as much as they use to. They're looking for low prices."

Competition of foreign steel is negligible on the West Coast, although Japanese interests are offering bars and plates at prices $29 to $35 under domestic quotations. Sentiment among service center operators is to keep clear of foreign deals and to patronize their established domestic mills.

Rails, Cars . . .

Track Material Prices, Page 104

Dullness in freight car buying is emphasized by the decline in June orders to 317 units, reports the American Railway Car Institute and the Association of American Railroads. In May, orders totaled 4918, and in June a year ago they were 4918.

Freight car deliveries in June totaled 2407, vs. 2534 in May and 8377 in June, 1957.

Order backlogs as of July 1 amounted to 27,757, vs. 30,386 on June 1 and 91,810 at the start of July a year ago.

Tin Plate . . .

Tin Plate Prices, Page 103

Tin plate's prosperity is being overstated, one Pittsburgh producer contends. He points out that the industry's shipments in the first five months of this year were 19 per cent below those in the like period of 1957. And he's not optimistic for third quarter volume.

Another maker commented last week: "We've been going along on an even keel so far. The first five months were all about the same, and then we had a June bulge —probably due to hedging. The can companies knew we wouldn't raise prices July 1, but they weren't taking any chances. They thought we'd be deluged with orders once a change was announced and that we wouldn't be able to ship everything they wanted in the 35 days that would elapse before new prices became effective."

Production of tin plate is not at capacity at midwestern mills, but demand is running a strong second to galvanized sheets.

Pig Iron . . .

Pig Iron Prices, Page 106

Merchant pig iron shipments are gaining slowly. Fewer foundries are closed for mass vacations, and some are taking delivery in July instead of August, partly as a price hedge.

Consumption still lags badly, and relatively little improvement is anticipated before September, unless the Mideast crisis gets completely out of hand. Automotive foundries are not taking additional iron in connection with new automobile model requirements.

Inventories of melters are low. While blast furnaces have substantial stocks, there might be an inclination to lay in a heavier supply of iron as added protection against a national emergency.

June Iron Output Rises

Blast furnace production (pig iron, ferromanganese, and spiegeleisen) totaled 4,422,748 net tons in June, reports the American Iron & Steel Institute. Of the total, only 26,463 tons were ferroalloys. In May, output was 4,073,796 tons (25,468 ferroalloys); in June, 1957, it was 6,659,592 tons (66,266 ferroalloys).

Output in the first six months this year totaled 25,705,006 net tons, of which 252,323 were ferroalloys. In the same period last year, the total was 41,658,851 tons (395,194 ferroalloys). Production by states:

BLAST FURNACE PRODUCTION
(Pig iron, Ferromanganese, Spiegeleisen. Net tons)

By State:	June, 1958	First 6 Months
Massachusetts, New York	248,688	1,671,803
Pennsylvania	1,183,860	6,911,639
Maryland, Virginia, W. Virginia	518,473	2,918,487
Kentucky, Tennessee, Texas	123,679	734,842
Alabama	292,394	1,666,293
Ohio	673,397	*3,962,723
Indiana	587,026	3,390,700
Illinois	275,541	1,678,607
Michigan, Minnesota	239,660	1,178,903
Colorado, Utah, California	280,030	1,591,009
Totals	4,422,748	*25,705,006
Ferromanganese & spiegeleisen included above	26,463	252,323

*Revised.
Data from the American Iron & Steel Institute.

Ferroalloys . . .

Ferroalloy Prices, Page 108

Production and shipments of silicon alloys during the first quarter were 8 per cent below what they were in the fourth quarter, 1957, reports the U. S. Bureau of Mines. Silicon metal was down 37 per cent.

Output of silvery pig iron, ferrosilicon, silicon briquets, silicon metal, and other silicon alloys amounted to 161,698 net tons in the first quarter, vs. 176,076 in the fourth quarter, 1957. First quarter shipments were 106,480 tons, against 168,645 in the fourth quarter last year.

Apparent consumption in the first quarter (shipments, plus imports, minus exports) dropped 63 per cent to 108,318 tons.

Stocks at producers' plants on Mar. 31 totaled 199,610 net tons, against 148,276 on Dec. 31, 1957.

In addition to the 106,480 tons shipped to domestic consumers, 5537 tons of silicon alloys were used in the production of other silicon alloys.

Imports of ferrosilicon for con-

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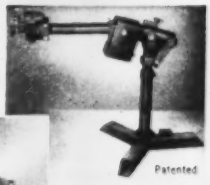
Aronson TracTred (T. M. Reg.) Turning Rolls for thin-walled heavy cylindrical work to 27 tons capacity. Zero to 100 IPM turning speed and Built-In Grounding.


Aronson Universal Balance Positioners (T. M. Reg.) position your weldments effectively, instantly for downhand welding. Capacities to 2000 lbs.
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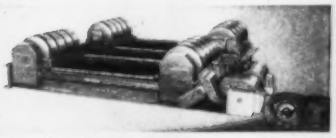
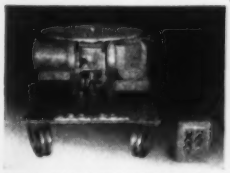
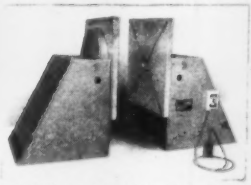
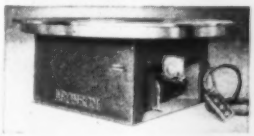
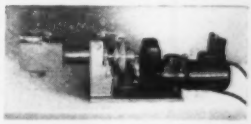

Heavy Duty Precision Built Rubber and Steel Tired Turning and Pipe Rolls, 100% overload protected. Capacities to 600 Tons.

Fully Automatic Gear Driven Positioners, featuring Geared Elevation, 135° Tilting and Variable or Constant Speed Rotation. Capacities to 350,000 lbs.


Model D Gear Driven Positioners. Compact, Precise, Rugged. Capacities to 1000 lbs.


Rugged Head and Tail Stock for positioning bulky weldments between centers. Table Backup for Zero Deflection. Magnetic Braking. Capacities to 160,000 lbs. Geared Elevation Optional.


Heavy Duty Floor Turntables with precision speed control and Magnetic Braking, used for welding, burning, X-raying, etc. Capacities to 120,000 lbs., various heights and speeds.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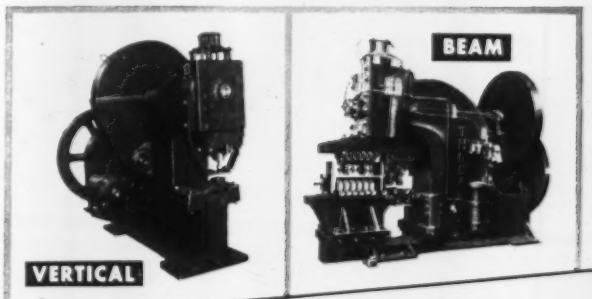

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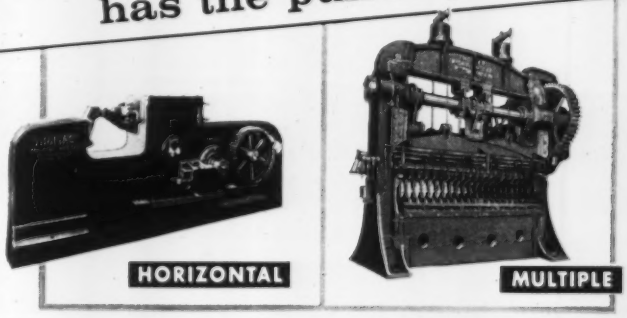

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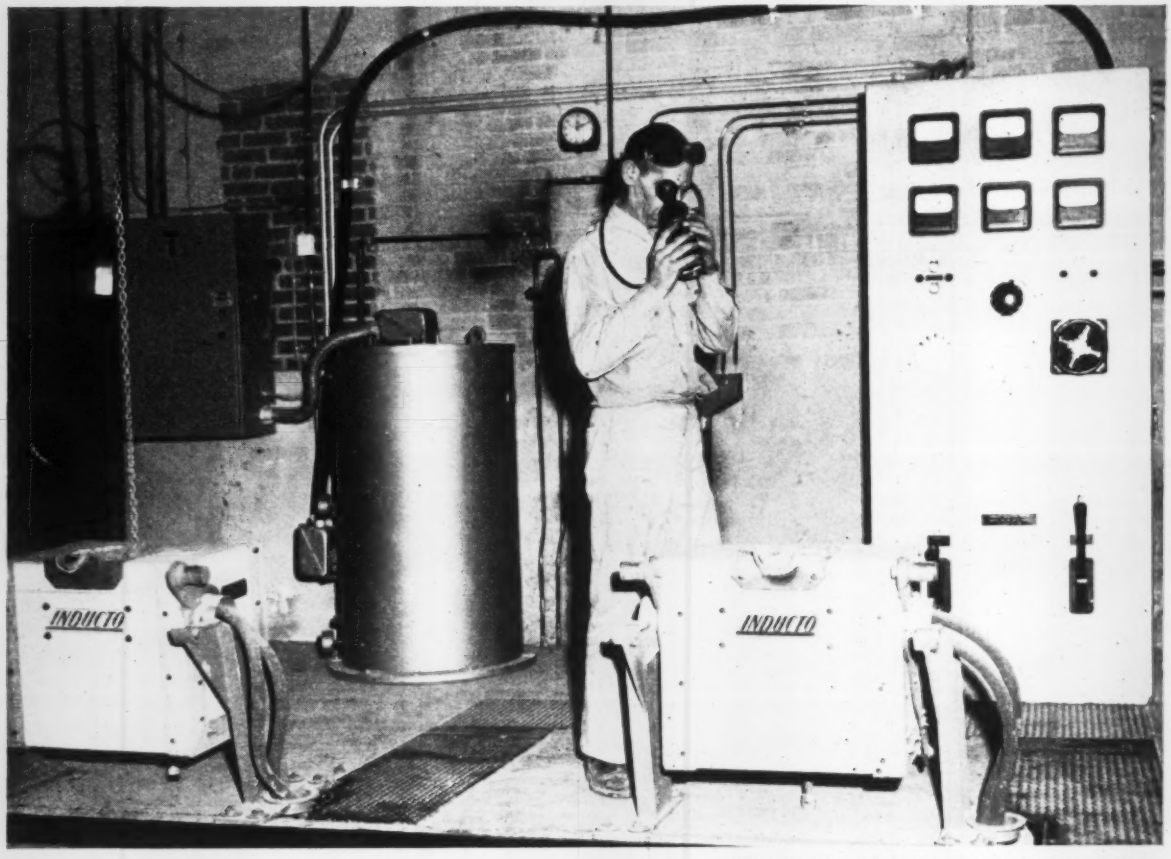
ANOTHER INDUCTO INSTALLATION...



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Connecticut Investment Casting Gets Accurate Heat Control In Every Melt With INDUCTO Furnaces

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INDUCTO high-frequency induction furnaces and controls have proven ideal for precision casting methods. For in addition to fast, clean, accurate melting, they are compact, efficient and designed for long, maintenance-free service.

The furnaces have sturdy welded frames which minimize distortion and assure longer lining life. The water-cooled leads enter the furnace through the trunnion thereby reducing the twisting and flexing which shorten lead life.

The control is compact and easy to operate. Furnace selector switches are conveniently mounted on the front of the panel. The control is shipped completely assembled and ready for installation.

For more complete details, write for Bulletin 70. Inductotherm Corporation, 412 Illinois Avenue, Delanco, N. J.

INDUCTOTHERM CORPORATION
INDUCTO

INDUCTOTHERM
corporation

sumption in the first quarter contained 427 tons of silicon, valued at $183,432; exports of 361 tons were valued at $88,326.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 107

Production of coke in May totaled 3,898,240 net tons (3,862,390 oven coke, 35,850 beehive), reports the U. S. Bureau of Mines. In May, 1957, output was 6,631,807 tons (6,451,371 oven coke, and 180,436 beehive).

Output in the first five months this year amounted to 20,919,224 tons (20,721,968 oven, 197,256 beehive), vs. 33,036,377 tons (31,874,511 oven and 1,161,866 beehive) in the corresponding period last year.

Producers' stocks of oven coke at the end of May totaled 3,886,162 net tons, equal to 31.2 days' production. The corresponding figure a year ago was 2,259,714 tons, equal to 10.7 days' production.

Structural Shapes . . .

Structural Shape Prices, Page 101

Highlighting structural market activity is the award of 27,670 tons for an office building for the Equitable Life Assurance Co., New York. The tonnage was taken by the American Bridge Div., U. S. Steel Corp., Pittsburgh. An award of 8000 tons of H-piling for the Throggs Neck Bridge over the East River, New York, went to the Bethlehem Steel Co., Bethlehem, Pa.

Substantial inquiry, mostly bridge construction and other public work, is before the market. Most fabricators have fair backlogs, but competition for work is keen.

Some grumbling is heard at Buffalo over the New York State Power Authority's steel award to an Italian producer. The steel is for a power project near Lewiston. Rumor has it the Italian bid was $60 a ton under the lowest American offer—it is said to cover delivery to Niagara Falls. Two cargoes of the steel have arrived, and another is on the way.

Fabricating shops expect a price increase on plain material of about $4 a ton around Sept. 1. Their estimates on new work, though, do not mirror this possible increase in their costs. This is because of sharp competition and the increasing number of lump sum bridge inquiries with prestressed concrete alternates.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

27,670 tons, office building, Equitable Life Assurance Co., Sixth Ave., between 51st and 52nd Streets, New York, through the Turner Construction Co., New York, to the American Bridge Div., U. S. Steel Corp., Pittsburgh.

8000 tons, H-piling, Throggs Neck Bridge, Triboro Bridge & Tunnel Authority, New York, through Merritt-Chapman & Scott Corp., New York, to Bethlehem Steel Co., Bethlehem, Pa.

5070 tons, ten composite WF beam bridges, two 2-deck cantilever spans, and two composite WF approach spans, bypass expressway project, Brattleboro, Vt., to American Bridge Div., U. S. Steel Corp., Pittsburgh; Lane Construction Co., Meriden, Conn., general contractor.

5000 tons, Iowa-Illinois suspension bridge over the Mississippi River, Davenport Bridge Commission, Davenport, Iowa, to the Bethlehem Steel Co., Bethlehem, Pa.

945 tons, highway and five grade separation structures, Middletown, Conn., to the Claymont Products Dept., Colorado Fuel & Iron Corp., Claymont, Del.; O. & E. Construction Co., Whitestone, N. Y., general contractor.

500 tons or more, Elizabeth Seton High School, Washington, to Atlas Machine & Iron Works, Arlington, Va. (structurals) and Ceco Steel Products Inc., New York (reinforcing bars); George A. Fuller Co., Washington, general contractor.

450 tons, senior high school, Bristol Township, Bucks County, Pennsylvania, to Grays Metal Works, Philadelphia.

198 tons, Forest Service bridge in Idaho, reported placed with the Missouri Valley Iron Works.

100 tons or more, four mobile cranes for ocean terminal, Anchorage, Alaska, to Washington Iron Works, Seattle.

STRUCTURAL STEEL PENDING

1475 tons, six grade separations, three bridges over Hockanum River, East Hartford Expressway, East Hartford, Conn.; bids July 28, Hartford; also 1285 tons, concrete reinforcing bars and 1255 tons, steel piles.

500 tons, also unstated piling tonnage, ocean terminals, Anchorage, Alaska; general contract to the DeLong Corp., New York.

400 tons, dairy, Portland, Oreg.; Paul B. Emerick Co., Portland, is low at $1,365,000 on the general contract.

400 tons or more, also reinforcing, substructure and approaches, Peace River Bridge, British Columbia-Alaska highway; Vancouver Pile Driving Co. Ltd. and Manning Construction Ltd., Vancouver, B. C., joint low at $1,194,383 to Defense Construction Ltd., Ottawa, Canada.

200 tons or more, 605-ft girder bridge, Rogue River, Oregon; Peter Kiewit Sons Co., Medford, Oreg., low at $349,305.

120 tons, Trafton Rd. bridge, Waterville, Maine; bids in; also 45 tons of concrete reinforcing bars.

115 tons, 2-span, WF beam bridge, Bennington, Vt.; W. H. Morse Construction Co.,

(Please turn to Page 98)

Shipments of Steel Products by Markets—May, 1958

(Net tons; all grades)

Markets:	May, 1958	May, 1957	First Five Months 1958	First Five Months 1957
Converting, processing	246,990	319,722	1,108,162	1,584,336
Forging (other than auto)	64,147	99,337	297,702	532,503
Fasteners	45,942	88,238	282,995	537,228
Warehouses:				
Oil & gas	55,585	219,220	359,357	1,144,020
All other	825,465	1,093,896	3,585,065	5,808,577
Total warehouse	881,050	1,313,116	3,944,422	6,952,597
Construction:				
Rail transportation	3,287	4,695	19,821	28,412
Oil & gas	231,400	346,880	830,051	1,497,090
All other	589,404	823,888	2,593,898	3,907,845
Total construction	824,091	1,175,463	3,443,770	5,433,347
Contractors' products	290,594	324,218	1,306,820	1,595,478
Automotive:				
Cars, trucks, parts	512,099	1,007,619	3,237,080	5,991,171
Forgings	14,849	22,850	91,321	151,048
Total automotive	526,948	1,030,469	3,328,401	6,142,219
Rail transportation:				
Rails, track, equipment	52,295	177,353	297,650	813,286
Cars & locomotives	64,999	257,232	415,214	1,275,173
Street cars, etc.	1,456	4,249	8,346	15,369
Total railroad	118,750	438,834	721,210	2,103,828
Shipbuilding	65,820	116,287	375,438	486,246
Aircraft	4,325	9,834	23,715	55,560
Oil & gas drilling	16,884	88,605	132,172	366,262
Mining, quarrying, etc.	19,787	34,419	80,790	156,567
Agricultural:				
Machinery	84,036	72,542	380,219	405,686
All other	28,461	16,095	94,559	82,396
Total agricultural	112,497	88,637	474,778	488,082
Machinery, tools, etc.	232,035	436,387	1,244,965	2,234,111
Elec. machinery, etc.	140,615	187,332	706,362	968,762
Appliances, etc.	105,999	126,017	572,319	716,963
Other equipment	140,186	166,333	656,951	844,291
Containers:				
Cans & closures	427,441	251,160	2,266,360	2,606,059
Barrels, drums, etc.	70,272	77,414	304,380	371,704
Other containers	41,277	52,605	185,271	279,708
Total containers	538,990	381,179	2,756,011	3,257,471
Ordnance, military	24,057	37,268	99,841	188,017
Nonreported shipments	53,951	78,709	262,435	392,508
Total domestic shipments	4,453,568	6,540,404	21,819,232	35,036,376
Exports	195,931	431,687	1,133,068	1,965,112
Total shipments	4,649,499	6,972,091	22,952,300	37,001,488

Data from the American Iron & Steel Institute.

(Concluded from Page 97)

Bennington, low bidder.

100 tons, including reinforcing, Essex Street Bridge, Bangor, Maine; bids July 30 to Augusta, Maine.

Unstated, 50-ton spillway gantry crane for Ice Harbor dam; bids to the U. S. Engineer, Walla Walla, Wash., Sept. 4.

REINFORCING BARS . . .

REINFORCING BARS PLACED

16,000 tons, 16 settling basins and control substructures for the Central District water filtration plant, Chicago, to Truscon Steel Div., Republic Steel Corp., Youngstown; A. L. Jackson Co., Chicago, is contractor.

960 tons, viaduct structures, Schuykill Expressway, Philadelphia, to Sweet's Steel Co., Williamsport, Pa.; F. A. Canuso & Sons Inc., Philadelphia, general contractor; 19,209 linear feet of steel beam piles, to Bethlehem Steel Co., Bethlehem, Pa.

300 tons, military installation, Ft. Lawton, Seattle, to Northwest Steel Rolling Mills Inc., Seattle; John H. Sellen Construction Co., Seattle, general contractor.

60 tons, military installation at Shemya, Alaska (150 tons for same project previously reported placed with Bethlehem Pacific Coast Steel Corp., Seattle).

REINFORCING BARS PENDING

1500 tons, deep sea terminal, Anchorage, Alaska; general contract to DeLong Corp., New York.

875 tons, two piers, Lake Washington freeway bridge, Seattle; bids to Olympia, Wash., Aug. 5.

625 tons, also 85 tons of shapes, Crooked River dam project; bids to the U. S. Bureau of Reclamation, Prineville, Oreg., Aug. 12.

100 tons, two Washington State highway spans, King County; bids to Olympia, Wash., Aug. 5.

Unstated, Oregon highway projects, low bids: Columbia County, two spans, R. L. Martin, Oswego, $53,666; Coos County, undercrossing, Sig Anderson, Coos Bay, $29,841; Gillam County, two bridges, Marshall Construction Co., Hermiston, $47,486; Linn County, five interchange structures, S. & D. Construction Co., Portland, $209,841; undercrossing, Hamilton & Thoms, Eugene, $177,355; Yamhill County, 200-ft bridge, Valley Construction Co., $74,134.

Unstated, Idaho State, Elmore County, 212-ft underpass and two bridges; Rogers Construction Co., Portland, Oreg., low at $1,616,037; Lewis County, two railroad underpasses; John E. Alexander Inc., Seattle, low at $391,246.

PLATES . . .

PLATES PLACED

1832 tons, heat-treated, Navy Purchasing Office, Washington, D. C., to Lukens Steel Co., Coatesville, Pa.

1380 tons, heat treated, Navy Purchasing Office, Washington, D. C., to U. S. Steel Corp., Pittsburgh.

100 tons, 20,000-gal. water tank for Oregon Game Commission, Salem, Oreg., to Gunderson Bros. Engineering Co., Portland, Oreg., low at $24,435.

PLATES PENDING

2000 tons (estimated), 38,500 ft, arcwelded, 52-in. diameter, 3/16-in. plate, Sultan River water supply line for Everett, Wash.; Engineers Ltd. Pipeline Co., Seattle, low at $1,422,268; alternative for concrete cylinder, Frank Coluccio Construction Co., Seattle, low at $1,330,749.

125 tons, 350,000-gal standpipe, Hurleyville Water District, Fallsburgh, N. Y.; bids Aug. 14.

Unstated, 13,000 ft 30 in., also under water crossing; bids soon to Eugene, Oreg.; alternatives for concrete cylinder.

PIPE . . .

CAST IRON PIPE PLACED

152 tons, 12 and 8 in., improvements at Alderwood Manor and King County Water District No. 39, to U. S. Pipe & Foundry Co., Seattle.

388 tons, 4 to 12 in., Seattle Water District, to the U. S. Pipe & Foundry Co., Seattle.

CAST IRON PIPE PENDING

300 tons, 16 in.; bids in to Seattle.

250 tons, system expansion, Seattle; bids in July 23.

Semifinished Steel . . .

Semifinished Prices, Page 101

Ingot production at the Worcester Works, American Steel & Wire Div., U. S. Steel Corp., ended July 26. Four open hearths (annual capacity 282,000 net tons) and soaking pits will be ultimately dismantled.

In the future, billets for the plant's rod mills will be supplied by the Fairless Works. A special freight rate, Morrisville, Pa., to Worcester, Mass., has been requested. It is expected to be granted since water shipment to New London or Providence, with trucking from either points to Worcester, is available.

June Steel Output Gains

Steel production in June totaled 7,127,480 net tons (6,661,051 carbon steel, 386,303 alloy other than stainless), reports the American Iron & Steel Institute. May output was 6,301,159 tons (5,845,117 carbon, 391,854 alloy); June a year ago production was 9,391,402 tons, of which 696,340 tons were alloy and 1,128,972 tons were hot topped ingots.

Output in the first half of this year amounted to 37,752,487 net tons (34,869,049 carbon, 2,503,194 alloy), vs. 41,263,657 tons in the same period last year (4,854,743 tons were alloy and 7,247,118 hot topped ingots). Production by states:

STEEL INGOT PRODUCTION
(Carbon and alloy)

By State:	June, 1958	First 6 Months 1958
Massachusetts, Rhode Island, Connecticut	16,741	100,873
New York	327,474	1,740,893
Pennsylvania	1,767,695	9,681,731
New Jersey, Delaware, Maryland	537,522	2,997,952
Virginia, W. Virginia, Kentucky, Tennessee	341,944	1,717,256
Georgia, Alabama, Mississippi	321,055	1,714,902
Ohio	1,060,780	5,734,180
Indiana	1,068,641	5,475,272
Illinois	562,800	3,001,613
Michigan, Minnesota	441,439	1,858,058
Missouri, Oklahoma, Texas, Colorado	306,445	1,539,903
Utah, Washington, Oregon	158,345	972,321
California	216,599	1,217,533
Totals	7,127,480	37,752,487

Data from the American Iron & Steel Institute.

DISTRICT INGOT RATES

(Percentage of Capacity Engaged)

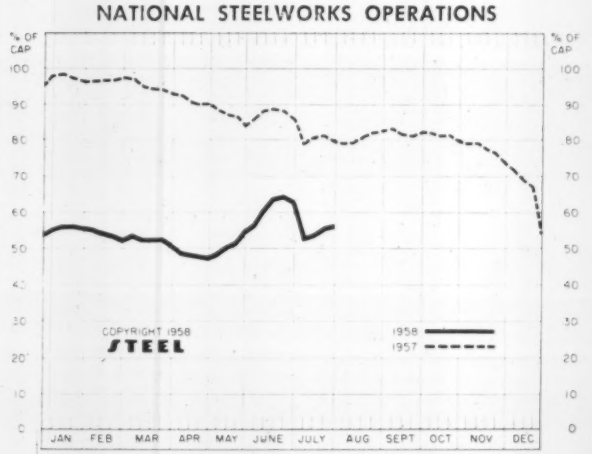
	Week Ended July 27	Change	Same Week 1957	Same Week 1956
Pittsburgh	49	+ 3*	88	2
Chicago	61.5	+ 1*	82.5	5.5
Mid-Atlantic	63	0	88	10
Youngstown	52	+ 3	77	5
Wheeling	71	— 2.5	70.5	57
Cleveland	49.5	+ 3.5*	76	0
Buffalo	44	0	90	0
Birmingham	53.5	0	87.5	3.5
New England	38	+ 8	55	39
Cincinnati	39.5	+ 0.5*	62	76.5
St. Louis	95	+ 2.5	79	95
Detroit	58.5	0	88.5	48.5
Western	67	0	100	32
National Rate	56	+ 0.5	79.5	15.5

INGOT PRODUCTION‡

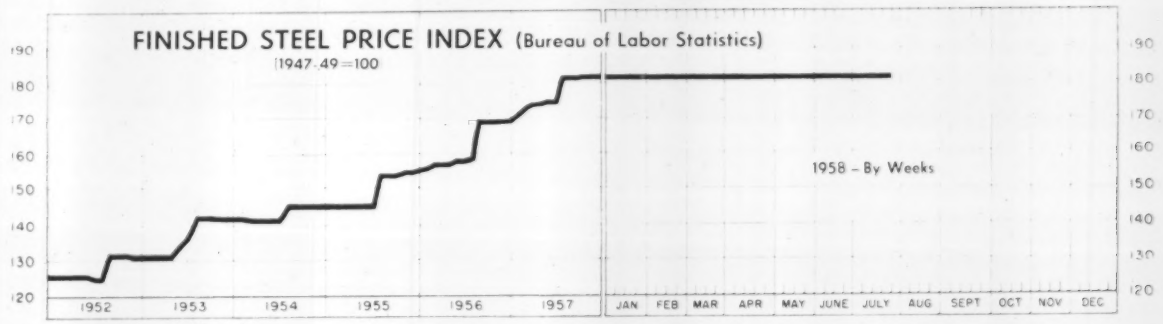
	Week Ended July 27	Week Ago	Month Ago	Year Ago
INDEX (1947-49=100)	95.9†	92.2	103.7	126.9
NET TONS (In thousands)	1,540†	1,481	1,666	2,033

*Change from preceding week's revised rate. †Estimated. ‡American Iron & Steel Institute. Weekly capacity (net tons): 2,699,173 in 1958; 2,559,490 in 1957; 2,461,893 in 1956.

NATIONAL STEELWORKS OPERATIONS



Price Indexes and Composites



July 22, 1958	Week Ago	Month Ago	June Avg	Year Ago
181.5	181.5	181.5	181.5	181.5

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics)

Week Ended July 22

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them, write to STEEL.

Rails, Standard No. 1	$5.600	Bars, Reinforcing	6.135
Rails, Light, 40 lb	7.067	Bars, C.F., Carbon	10.360
Tie Plates	6.600	Bars, C.F., Alloy	13.875
Axles, Railway	9.825	Bars, C.F., Stainless, 302 (lb)	0.553
Wheels, Freight Car, 33 in. (per wheel)	60.000	Sheets, H.R., Carbon	6.175
Plates, Carbon	6.150	Sheets, C.R., Carbon	7.075
Structural Shapes	5.942	Sheets, Galvanized	8.270
Bars, Tool Steel, Carbon (lb)	0.535	Sheets, C.R., Stainless, 302 (lb)	0.688
Bars, Tool Steel, Alloy, Oil Hardening Die (lb)	0.650	Sheets, Electrical	12.025
Bars, Tool Steel, H.R., Alloy, High Speed, W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.60 (lb)	1.355	Strip, C.R., Carbon	9.214
Bars, Tool Steel, H.R., Alloy, High Speed, W18, Cr 4, V 1 (lb)	1.850	Strip, C.R., Stainless, 430 (lb)	0.493
Bars, H.R., Alloy	10.525	Strip, H.R., Carbon	6.075
Bars, H.R., Stainless, 303 (lb)	0.525	Pipe, Black, Buttweld (100 ft)	19.814
Bars, H.R., Carbon	6.425	Pipe, Galv., Buttweld (100 ft)	23.264
		Pipe, Line (100 ft)	199.023
		Casing, Oil Well, Carbon (100 ft)	194.499
		Casing, Oil Well, Alloy (100 ft)	304.610
Tubes, Boiler (100 ft)	49.130	Black Plate, Canmaking Quality (95 lb base box)	7.583
Tubing, Mechanical, Carbon (100 ft)	24.953	Wire, Drawn, Carbon	10.225
Tubing, Mechanical, Stainless, 304 (100 ft)	205.608	Wire, Drawn, Stainless, 430 (lb)	0.653
Tin Plate, Hot-dipped, 1.25 lb (95 lb base box)	9.783	Bale Ties (bundles)	7.967
Tin Plate, Electrolytic, 0.25 lb (95 lb base box)	8.483	Nails, Wire, 8d Common	9.828
		Wire, Barbed (80-rod spool)	8.719
		Woven Wire Fence (20-rod roll)	21.737

STEEL's FINISHED STEEL PRICE INDEX*

	July 23 1958	Week Ago	Month Ago	Year Ago	5 Yr Ago
Index (1935-39 avg=100)	239.15	239.15	239.15	239.15	189.33
Index in cents per lb	6.479	6.479	6.479	6.479	5.129

STEEL's ARITHMETICAL PRICE COMPOSITES*

Finished Steel, NT	$145.42	$145.42	$145.42	$146.19	$114.89
No. 2 Fdry Pig Iron, GT	66.49	66.49	66.49	66.49	56.54
Basic Pig Iron, GT	65.99	65.99	65.99	65.99	56.04
Malleable Pig Iron, GT	67.27	67.27	67.27	67.27	57.27
Steelmaking Scrap, GT	37.67	36.67	35.00	54.00	43.42

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130. †Revised.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL

	July 23 1958	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bars, H.R., Pittsburgh	5.425	5.425	5.425	5.425	4.15
Bars, H.R., Chicago	5.425	5.425	5.425	5.425	4.15
Bars, H.R., deld. Philadelphia	5.725	5.725	5.725	5.715	5.302
Bars, C.F., Pittsburgh	7.30*	7.30*	7.30*	7.30*	5.20
Shapes, Std., Pittsburgh	5.275	5.275	5.275	5.275	4.10
Shapes, Std., Chicago	5.275	5.275	5.275	5.275	4.10
Shapes, deld., Philadelphia	5.545	5.545	5.545	5.585	4.38
Plates, Pittsburgh	5.10	5.10	5.10	5.10	4.10
Plates, Chicago	5.10	5.10	5.10	5.10	4.10
Plates, Coatesville, Pa.	5.10	5.10	5.10	5.50	4.35
Plates, Sparrows Point, Md.	5.10	5.10	5.10	5.10	4.10
Plates, Claymont, Del.	5.10	5.10	5.10	5.70	4.55
Sheets, H.R., Pittsburgh	4.925	4.925	4.925	4.925	3.925
Sheets, H.R., Chicago	4.925	4.925	4.925	4.925	3.925
Sheets, C.R., Pittsburgh	6.05	6.05	6.05	6.05	4.775
Sheets, C.R., Chicago	6.05	6.05	6.05	6.05	4.775
Sheets, C.R., Detroit	6.05	6.05	6.05	6.05-6.15	4.975
Sheets, Galv., Pittsburgh	6.60	6.60	6.60	6.60	5.275
Strip, H.R., Pittsburgh	4.925	4.925	4.925	4.925	3.975-4.425
Strip, H.R., Chicago	4.925	4.925	4.925	4.925	3.925
Strip, C.R., Pittsburgh	7.15	7.15	7.15	7.15	5.45-5.95
Strip, C.R., Chicago	7.15	7.15	7.15	7.15	5.70
Strip, C.R., Detroit	7.15	7.15	7.15	7.25	5.45-6.05
Wire, Basic, Pittsburgh	7.65	7.65	7.65	7.65	5.475-5.525
Nails, Wire, Pittsburgh	8.95	8.95	8.95	8.95	6.35-6.55
Tin plate (1.50 lb)box, Pitts.	$10.30	$10.30	$10.30	$10.30	$8.95

*Including 0.35c for special quality.

SEMIFINISHED STEEL

Billets, forging, Pitts. (NT)	$96.00	$96.00	$96.00	$96.00	$75.50
Wire rods 7/32-5/8" Pitts.	6.15	6.15	6.15	6.15	4.525

PIG IRON, Gross Ton

	July 23 1958	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bessemer, Pitts.	$67.00	$67.00	$67.00	$67.00	$57.00
Basic, Valley	66.00	66.00	66.00	66.00	56.00
Basic, deld., Phila.	70.41	70.41	70.41	69.88	60.75
No. 2 Fdry, Neville Island, Pa.	66.50	66.50	66.50	66.50	56.50
No. 2 Fdry, Chicago	66.50	66.50	66.50	66.50	56.50
No. 2 Fdry, deld., Phila.	70.91	70.91	70.91	70.38	61.25
No. 2 Fdry, Birm.	62.50	62.50	62.50	62.50	52.88
No. 2 Fdry (Birm.) deld. Cin	70.20	70.20	70.20	70.20	60.43
Malleable, Valley	66.50	66.50	66.50	66.50	56.50
Malleable, Chicago	66.50	66.50	66.50	66.50	56.50
Ferromanganese, net ton	245.00†	245.00†	245.00†	255.00†	200.00*

†74-76% Mn, Duquesne, Pa. *Etna, Pa.

SCRAP, Gross Ton (Including broker's commission)

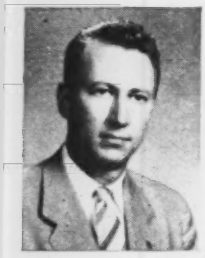
No. 1 Heavy Melt, Pittsburgh	$37.50	$35.50	$35.50	$55.50	$44.50
No. 1 Heavy Melt, E. Pa.	35.00	35.00	34.00	53.50	44.25
No. 1 Heavy Melt, Chicago	40.50	39.50	35.50	53.00	41.50
No. 1 Heavy Melt, Valley	41.50	38.50	36.50	54.50	45.50
No. 1 Heavy Melt, Cleve.	38.50	35.00	33.00	51.50	44.50
No. 1 Heavy Melt, Buffalo	27.50	27.50	26.50	46.50	43.75
Rails, Rerolling, Chicago	61.50	55.50	52.50	79.50	54.50
No. 1 Cast, Chicago	44.50	41.50	39.50	47.50	41.00

COKE, Net Ton

Beehive, Furn., Connlsvl.	$15.25	$15.25	$15.25	$15.25	$14.75
Beehive, Fdry., Connlsvl.	18.25	18.25	18.25	18.25	16.75

Chemical Prepaint Treatments for Metal Surfaces

What they do, the types available, how they are applied



By J. H. GEYER
Manager, Product Development Dept., AMCHEM PRODUCTS, INC.

Paint systems have been steadily improved in an effort to produce more decorative, easier-to-apply, and more corrosion-resistant films. The ability, however, of any paint film to perform its predetermined functions cannot be fully utilized without properly preparing the metal surface.

The prepaint preparation of the metal surface is therefore a highly important part of the system. Chemical prepaint treatments are designed to do four jobs and do them well. First, they remove organic soils, shop dirt, scale, and rust or corrosion products from the metal surface. Second, they provide surfaces that are completely compatible with subsequent paint films. Third, they produce a *tooth* that promotes good paint film adhesion. Fourth, they effectively prevent underpaint corrosion growth after any breakthrough in the paint film.

Basically, there are four types of chemical prepaint treatments. These are phosphoric acid, iron phosphate, zinc phosphate, and amorphous phosphate or chromate. Each is discussed briefly in the following paragraphs.

Phosphoric Acid

Perhaps the most widely used and certainly one of the most economical chemical prepaint treatments is the phosphoric acid cleaner combination materials. ACP Deoxidine® is such a material. It removes organic soils, rust, scale and contaminating elements from the metal surface. It also produces a light etch on steel, aluminum or zinc surfaces which considerably aids in increasing paint adhesion. It does not, however, form an actual coating on the metal surface. Any breakthrough in the subsequent paint film will permit underfilm corrosion to proceed. Grades of Deoxidine are available for application by brush or swab, hot and cold dip, or hot spray.

Iron Phosphate

Iron phosphating processes are extensively used in the chemical prepaint treatment of appliances such as water heater shells, ranges, washers, dryers and other *white lines*. These processes will produce excellent paint-bonding films on the metal and retard or prevent underpaint corrosion. Duridine,® ACP's iron phosphating process, is a combination organic soil cleaner and iron phosphate coating material. Both the cleaning and coating operations take place in the same bath. Duridine and other iron phosphates do not lend themselves to brush-on application, are primarily designed for spray type equipment of four or five stages. But several dip installations are successfully operating today by inclusion of an alkali precleaning stage.

Zinc Phosphate

ACP Granodine® is an example of this type of chemical prepaint treatment process, the type now being used to treat steel in the automotive industry, and predominantly specified for steel ordnance and military items. This process forms a coating which offers the ultimate in paint adhesion promotion and vastly augments the corrosion resistance of subsequent paint films. Zinc phosphate materials are extremely flexible as to method of application—can be applied by brush, dip or automatic spray equipment. In a typical dip or power spray system, the stages would be alkali clean, water rinse, zinc phosphate treatment, water rinse, and acidulated final rinse. If the metal has considerable areas of rust or scale, an acid pickle is advisable following the alkali cleaning stage.

On zinc surfaces, the zinc phosphates perform a rather unique function. They act as a barrier against chemical reaction between the applied paint film and the zinc surface. This effectively prevents blistering of the paint and early breakdown of the film. This is in addition, of course, to the improvement of paint adhesion and the retarding of underpaint corrosion. ACP Lithoform® is specially designed for use over zinc surfaces and finds wide application as a prepaint treatment for ornamental zinc die castings, refrigerator liners, and on most galvanized work requiring painted finishes.

Amorphous Phosphate and Chromate

These coatings are the films produced by the ACP Alodine processes and similar ones on aluminum surfaces. They have met with wide acceptance in the prepaint treatment of venetian blind strips, refrigerator liners, aluminum heat transfer units, aircraft sheet metal assemblies, and many other items fabricated from aluminum. The various coatings provide an excellent film for the promotion of paint adhesion and effectively prevent underfilm corrosion. As in the case of zinc, aluminum exhibits a tendency to chemically react with some paint systems. The Alodine processes develop a barrier film between the paint and the aluminum surfaces which prevents this reaction. The Alodines are extremely versatile materials that can be applied to aluminum surfaces by brush, hand spray, dipping, mechanical spraying, or roller coating equipment. Brush application is particularly well adapted to the processing of parts too large for simple dip systems or in manufacturing operations that do not warrant a tank setup. In dip, spray or roller coating application, the system usually consists of an alkaline preclean, a water rinse, the Alodine treatment, a water rinse, and an acidulated final rinse. Where the surface is heavily oxidized, a deoxidizer in the line is needed.

The major chemical prepaint treatments for metals have been covered briefly in this article. More complete information can be had by contacting an ACP sales representative or by writing us at Ambler, Pa.

Amchem Products, Inc.
Ambler 20, Pa.
Formerly
AMERICAN CHEMICAL PAINT COMPANY
CHEMICALS ACP PROCESSES
DETROIT, MICH. • ST. JOSEPH, MO.
NILES, CALIF. • WINDSOR, ONT.
New Chemical Horizons for Industry and Agriculture

Steel Prices

Mill prices as reported to STEEL, July 23, cents per pound except as otherwise noted. *Changes shown in italics.* Code number following mill points indicate producing company. Key to producers, page 102; footnotes, page 104.

SEMIFINISHED

INGOTS, Carbon, Forging (NT)

Munhall,Pa. U5 ....$73.50

INGOTS, Alloy (NT)

Detroit S41 ....$77.00
Farrell,Pa. S3 ....77.00
Lowellville,O. S3 ....77.00
Midland,Pa. C18 ....77.00
Munhall,Pa. U5 ....77.00
Sharon,Pa. S3 ....77.00

BILLETS, BLOOMS & SLABS
Carbon, Rerolling (NT)

Bessemer,Pa. U5 ....$77.50
Buffalo R2 ....77.50
Clairton,Pa. U5 ....77.50
Ensley,Ala. T2 ....77.50
Fairfield,Ala. T2 ....77.50
Fontana,Calif. K1 ....88.00
Gary,Ind. U5 ....77.50
Johnstown,Pa. B3 ....77.50
Lackawanna,N.Y. B2 ....77.50
Munhall,Pa. U5 ....77.50
Owensboro,Ky. G8 ....77.50
S Chicago,Ill. R2, U5 ....77.50
S.Duquesne,Pa. U5 ....77.50
Sterling,Ill. N15 ....77.50
Youngstown R2 ....77.50

Carbon, Forging (NT)

Bessemer,Pa. U5 ....$96.00
Buffalo R2 ....96.00
Canton,O. R2 ....98.50
Clairton,Pa. U5 ....96.00
Conshohocken,Pa. A3 ..101.00
Ensley,Ala. T2 ....96.00
Fairfield,Ala. T2 ....96.00
Fontana,Calif. K1 ....105.50
Gary,Ind. U5 ....96.00
Geneva,Utah C11 ....96.00
Houston S5 ....101.00
Johnstown,Pa. B2 ....96.00
Lackawanna,N.Y. B2 ..96.00
LosAngeles B3 ....105.50
Midland,Pa. C18 ....96.00
Munhall,Pa. U5 ....96.00
Owensboro,Ky. G8 ....96.00
Seattle B3 ....109.50
Sharon,Pa. S3 ....96.00
S Chicago R2, U5, W14 ..96.00
S.Duquesne,Pa. U5 ....96.00
S.SanFrancisco B3 ..105.50
Warren,O. C17 ....96.00

Alloy, Forging (NT)

Bethlehem,Pa. B2 ....$114.00
Bridgeport,Conn. C32 ..114.00
Buffalo R2 ....114.00
Canton,O. R2, T7 ....114.00
Conshohocken,Pa. A3 ..121.00
Detroit S41 ....114.00
Economy,Pa. B14 ....114.00
Farrell,Pa. S3 ....114.00
Fontana,Calif. K1 ....135.00
Gary,Ind. U5 ....114.00
Houston S5 ....119.00
Ind.Harbor,Ind. Y1 ....114.00
Johnstown,Pa. B2 ....114.00
Lackawanna,N.Y. B2 ..114.00
LosAngeles B3 ....131.00
Lowellville,O. S3 ....114.00
Massillon,O. R2 ....114.00
Midland,Pa. C18 ....114.00
Munhall,Pa. U5 ....114.00
Owensboro,Ky. G8 ....114.00
Sharon,Pa. S3 ....114.00
S.Chicago R2,U5,W14 ..114.00
S.Duquesne,Pa. U5 ..114.00
Struthers,O. Y1 ....114.00
Warren,O. C17 ....114.00

ROUNDS, SEAMLESS TUBE (NT)

Buffalo R2 ....$117.50
Canton,O. R2 ....120.00
Cleveland R2 ....117.50
Gary,Ind. U5 ....117.50
S.Chicago,Ill. R2, W14 117.50
S.Duquesne,Pa. U5 ..117.50
Warren,O. C17 ....117.50

SKELP

Aliquippa,Pa. J5 ....5.075
Munhall,Pa. U5 ....4.875
Pittsburgh J5 ....5.075
Warren,O. R2 ....4.875
Youngstown R2, U5 ..4.875

WIRE RODS

AlabamaCity,Ala. R2 ..6.15
Aliquippa,Pa. J5 ....6.15
Alton,Ill. L1 ....6.35
Buffalo W12 ....6.15
Cleveland A7 ....6.15
Donora,Pa. A7 ....6.15
Fairfield,Ala. T2 ....6.15
Houston S5 ....6.40
IndianaHarbor,Ind. Y1 ..6.15
Johnstown,Pa. B2 ....6.15
Joliet,Ill. A7 ....6.15
KansasCity,Mo. S5 ....6.40
Kokomo,Ind. C16 ....6.25
LosAngeles B3 ....6.95
Minnequa,Colo. C10 ....6.40
Monessen,Pa. P7 ....6.15
N.Tonawanda,N.Y. B11 ..6.15
Pittsburg,Calif. C11 ....6.95
Portsmouth,O. P12 ....6.15
Roebling,N.J. R5 ....6.25
S.Chicago,Ill. R2 ....6.15
SparrowsPoint,Md. B2 ..6.25
Sterling,Ill. (1) N15 ....6.15
Sterling,Ill. N15 ....6.25
Struthers,O. Y1 ....6.15
Worcester,Mass. A7 ....6.45

STRUCTURALS

Carbon Steel Std. Shapes

AlabamaCity,Ala. R2 ..5.275
Atlanta A11 ....5.475
Aliquippa,Pa. J5 ....5.275
Bessemer,Ala. T2 ....5.275
Bethlehem,Pa. B2 ....5.325
Birmingham C15 ....5.275
Clairton,Pa. U5 ....5.275
Fairfield,Ala. T2 ....5.275
Fontana,Calif. K1 ....5.975
Gary,Ind. U5 ....5.275
Geneva,Utah C11 ....5.275
Houston S5 ....5.375
Ind.Harbor,Ind. I-2 ..5.275
Johnstown,Pa. B2 ....5.325
Joliet,Ill. P22 ....5.275
KansasCity,Mo. S5 ....5.375
Lackawanna,N.Y. B2 ..5.325
LosAngeles B3 ....5.975
Minnequa,Colo. C10 ....5.575
Munhall,Pa. U5 ....5.275
Niles,Calif. P1 ....5.925
Phoenixville,Pa. P4 ....5.325
Portland,Oreg. O4 ....6.025
Seattle B3 ....6.025
S.Chicago,Ill. U5, W14 5.275
S.SanFrancisco B3 ....5.925
Sterling,Ill. N15 ....5.275
Torrance,Calif. C11 ....5.975
Weirton,W.Va. W6 ....5.275

Wide Flange

Bethlehem,Pa. B2 ....5.325
Clairton,Pa. U5 ....5.275
Fontana,Calif. K1 ....6.025
IndianaHarbor,Ind. I-2 5.275
Lackawanna,N.Y. B2 ..5.325
Munhall,Pa. U5 ....5.275
Phoenixville,Pa. P4 ....5.325
S.Chicago,Ill. U5 ....5.275
Weirton,W.Va. W6 ....5.275

Alloy Std. Shapes

Aliquippa,Pa. J5 ....6.55
Clairton,Pa. U5 ....6.55
Gary,Ind. U5 ....6.55
Houston S5 ....6.65
KansasCity,Mo. S5 ....6.65
Munhall,Pa. U5 ....6.55
S.Chicago,Ill. U5 ....6.55

H.S., L.A. Std. Shapes

Aliquippa,Pa. J5 ....7.75
Bessemer,Ala. T2 ....7.75
Bethlehem,Pa. B2 ....7.80
Clairton,Pa. U5 ....7.75
Fairfield,Ala. T2 ....7.75
Fontana,Calif. K1 ....8.55
Gary,Ind. U5 ....7.75
Geneva,Utah C11 ....7.75
Houston S5 ....7.85
Ind.Harbor,Ind. I-2, Y1 7.75
Johnstown,Pa. B2 ....7.80
KansasCity,Mo. S5 ....7.85
Lackawanna,N.Y. B2 ..7.80
LosAngeles B3 ....8.45
Munhall,Pa. U5 ....7.75
Seattle B3 ....8.50
S.Chicago,Ill. U5, W14 ..7.75
S.SanFrancisco B3 ....8.40
Struthers,O. Y1 ....7.75

H.S., L.A. Wide Flange

Bethlehem,Pa. B2 ....7.80
Lackawanna,N.Y. B2 ..7.80
Munhall,Pa. U5 ....7.75
S.Chicago,Ill. U5 ....7.75

PILING

BEARING PILES

Bethlehem,Pa. B2 ....5.325
Lackawanna,N.Y. B2 ..5.325
Munhall,Pa. U5 ....5.275
S.Chicago,Ill. U5 ....5.275

STEEL SHEET PILING

Lackawanna,N.Y. B2 ..6.225
Munhall,Pa. U5 ....6.225
S.Chicago,Ill. U5 ....6.225
Weirton,W.Va. W6 ....6.225

PLATES

PLATES, Carbon Steel

AlabamaCity,Ala. R2 ..5.10
Aliquippa,Pa. J5 ....5.10
Ashland,Ky.(15) A10 ....5.10
Atlanta A11 ....5.30
Bessemer,Ala. T2 ....5.10
Clairton,Pa. U5 ....5.10
Claymont,Del. C22 ....5.10
Cleveland J5, R2 ....5.20
Coatesville,Pa. L7 ....5.10
Conshohocken,Pa. A3 ..5.10
Ecorse,Mich. G5 ....5.10
Fairfield,Ala. T2 ....5.10
Fontana,Calif.(30) K1 ..5.90
Gary,Ind. U5 ....5.10
Geneva,Utah C11 ....5.10
GraniteCity,Ill. G4 ....5.20
Harrisburg,Pa. P4 ....5.10
Houston S5 ....5.20
Ind.Harbor,Ind. I-2, Y1.5.10
Johnstown,Pa. B2 ....5.10
Lackawanna,N.Y. B2 ..5.10
LoneStar,Tex. L6 ....5.20
Mansfield,O. E6 ....5.10
Minnequa,Colo. C10 ....5.95
Munhall,Pa. U5 ....5.10
Newport,Ky. A2 ....5.10
Pittsburgh J5 ....5.10
Riverdale,Ill. A1 ....5.10
Seattle B3 ....6.00
Sharon,Pa. S3 ....5.10
S.Chicago,Ill. U5, W14 ..5.10
SparrowsPoint,Md. B2 ..5.10
Sterling,Ill. N15 ....5.10
Steubenville,O. W10 ....5.10
Warren,O. R2 ....5.10
Youngstown U5, Y1 ....5.10

PLATES, Carbon Abras. Resist.

Claymont,Del. C22 ....6.75
Fontana,Calif. K1 ....7.55
Geneva,Utah C11 ....6.75
Houston S5 ....6.85
Johnstown,Pa. B2 ....6.75
SparrowsPoint,Md. B2 ..6.75

PLATES, Wrought Iron

Economy,Pa. B14 ....13.15

PLATES, H.S., L.A.

Aliquippa,Pa. J5 ....7.625
Bessemer,Ala. T2 ....7.625
Clairton,Pa. U5 ....7.625
Claymont,Del. C22 ....7.625
Cleveland J5, R2 ....7.625
Coatesville,Pa. L7 ....7.625
Conshohocken,Pa. A3 ..7.625
Economy,Pa. B14 ....7.625
Ecorse,Mich. G5 ....7.625
Fairfield,Ala. T2 ....7.625
Farrell,Pa. S3 ....7.625
Fontana,Calif.(30) K1 ..8.425
Gary,Ind. U5 ....7.625
Geneva,Utah C11 ....7.625
Houston S5 ....7.725
Ind.Harbor,Ind. I-2, Y1.7.625
Johnstown,Pa. B2 ....7.625
Munhall,Pa. U5 ....7.625
Pittsburgh J5 ....7.625
Seattle B3 ....8.525
Sharon,Pa. S3 ....7.625
S.Chicago,Ill. U5, W14 ..7.625
SparrowsPoint,Md. B2 ..7.625
Warren,O. R2 ....7.625
Youngstown U5 ....7.625

PLATES, ALLOY

Aliquippa,Pa. J5 ....7.20
Claymount,Del. C22 ....7.20
Coatesville,Pa. L7 ....7.20
Economy,Pa. B14 ....7.20
Fontana,Calif. K1 ....8.00
Gary,Ind. U5 ....7.20
Houston S5 ....7.30
Ind.Harbor,Ind. Y1 ....7.20
Johnstown,Pa. B2 ....7.20
Lowellville,O. S3 ....7.20
Munhall,Pa. U5 ....7.20
Newport,Ky. A2 ....7.20
Pittsburgh J5 ....7.20
Seattle B3 ....8.10
Sharon,Pa. S3 ....7.20
S.Chicago,Ill. U5, W14 ..7.20
SparrowsPoint,Md. B2 ..7.20
Youngstown Y1 ....7.20

FLOOR PLATES

Cleveland J5 ....6.175
Conshohocken,Pa. A3 ..6.175
Ind.Harbor, Ind. I-2 ..6.175
Munhall,Pa. U5 ....6.175
S.Chicago,Ill. U5 ....6.175

PLATES, Ingot Iron

Ashland c.l.(15) A10 ..5.35
Ashland l.c.l(15) A10..5.85
Cleveland c.l. R2 ....5.85
Warren,O. c.l. R2 ....5.85

BARS

BARS, Hot-Rolled Carbon (Merchant Quality)

Ala.City,Ala.(9) R2 ..5.425
Aliquippa,Pa.(9) J5 ..5.425
Alton,Ill. L1 ....5.625
Atlanta(9) A11 ....5.625
Bessemer,Ala.(9) T2 ..5.425
Birmingham(9) C15 ..5.425
Buffalo(9) R2 ....5.425
Clairton,Pa.(9) U5 ....5.425
Cleveland (9) R2 ....5.425
Ecorse,Mich.(9) G5 ....5.425
Emeryville,Calif. J7 ....6.175
Fairfield,Ala.(9) T2 ....5.425
Fairless,Pa.(9) U5 ....5.575
Fontana,Calif.(9) K1 ..6.125
Gary,Ind.(9) U5 ....5.425
Houston(9) S5 ....5.675
Ind.Harbor(9) I-2, Y1..5.425
Johnstown,Pa.(9) B2 ..5.425
Joliet,Ill. P22 ....5.425
KansasCity,Mo.(9) S5 ..5.675
Lackawanna(9) B2 ....5.425
LosAngeles(9) B3 ....6.125
Midland,Pa.(23) C18 ..5.725
Milton,Pa. M18 ....5.575
Minnequa,Colo. C10 ....5.875
Niles,Calif. P1 ....6.125
N.T'wanda,N.Y.(23)B11 5.775
Owensboro,Ky.(9) G8 ..5.425
Pittsburg,Calif.(9) C11..6.125
Pittsburgh(9) J5 ....5.425
Portland,Oreg. O4 ....6.175
Seattle B3, N14 ....6.175
S.Ch'c'go(9)R2,U5,W14 5.425
S.Duquesne,Pa.(9) U5 ..5.425
S.SanFran.,Calif.(9)B3 6.175
Sterling,Ill.(1)(9) N15..5.425
Sterling,Ill.(9) N15 ....5.525
Struthers,O.(9) Y1 ....5.425
Tonawanda,N.Y. B12 ....5.425
Torrance,Calif.(9) C11 ..6.125
Youngstown(9)R2, U5 ..5.425

BARS, H.R. Leaded Alloy
(Including leaded extra)

Warren,O. C17 ....7.475

BARS, Hot-Rolled Alloy

Aliquippa,Pa. J5 ....6.475
Bethlehem,Pa. B2 ....6.475
Bridgeport,Conn. C32 ..6.55
Buffalo R2 ....6.475
Canton,O. R2, T7 ....6.475
Clairton,Pa. U5 ....6.475
Detroit S41 ....6.475
Economy,Pa. B14 ....6.475
Ecorse,Mich. G5 ....6.475
Fairless,Pa. U5 ....6.625
Farrell,Pa. S3 ....6.475
Fontana,Calif. K1 ....7.525
Gary,Ind. U5 ....6.475
Houston S5 ....6.725
Ind.Harbor,Ind. I-2, Y1..6.475
Johnstown,Pa. B2 ....6.475
KansasCity,Mo. S5 ....6.725
Lackawanna,N.Y. B2 ....6.475
Lowellville,O. S3 ....6.475
LosAngeles B3 ....7.525
Massillon,O. R2 ....6.475
Midland,Pa. C18 ....6.475
Owensboro,Ky. G8 ....6.475
Pittsburgh J5 ....6.475
Sharon,Pa. S3 ....6.475
S.Chicago R2, U5, W14 6.475
S.Duquesne,Pa. U5 ....6.475
Struthers,O. Y1 ....6.475
Warren,O. C17 ....6.475
Youngstown U5 ....6.475

BARS & SMALL SHAPES, H.R.
High-Strength, Low-Alloy

Aliquippa,Pa. J5 ....7.925
Bessemer,Ala. T2 ....7.925
Bethlehem,Pa. B2 ....7.925
Clairton,Pa. U5 ....7.925
Cleveland R2 ....7.925
Ecorse,Mich. G5 ....7.925
Fairfield,Ala. T2 ....7.925
Fontana,Calif. K1 ....8.625
Gary,Ind. U5 ....7.925
Houston S5 ....8.175
Ind.Harbor,Ind. Y1 ....7.925
Johnstown,Pa. B2 ....7.925
KansasCity,Mo. S5 ....8.175
Lackawanna,N.Y. B2 ..7.925
LosAngeles B3 ....8.625
Pittsburgh J5 ....7.925
Seattle B3 ....8.675
S.Chicago,Ill. U5, W14 7.925
S.Duquesne,Pa. U5 ....7.925
S.SanFrancisco B3 ....8.675
Struthers,O. Y1 ....7.925
Youngstown U5 ....7.925

BAR SIZE ANGLE; H.R. Carbon

Bethlehem,Pa.(9) B2 ..5.575
Houston(9) S5 ....5.675
KansasCity,Mo.(9) S5 ..5.675
Lackawanna(9) B2 ....5.425
Sterling,Ill. N15 ....5.525
Sterling,Ill.(1) N15 ....5.425
Tonawanda,N.Y. B12 ....5.425

BAR SIZE ANGLES; S. Shapes

Aliquippa,Pa. J5 ....5.425
Atlanta A11 ....5.625
Joliet,Ill. P22 ....5.425
Niles,Calif. P1 ....6.125
Pittsburgh J5 ....5.425
Portland,Oreg. O4 ....6.175
SanFrancisco S7 ....6.275
Seattle B3 ....6.175

BAR SHAPES, Hot-Rolled Alloy

Aliquippa,Pa. J5 ....6.55
Clairton,Pa. U5 ....6.55
Gary,Ind. U5 ....6.55
Houston S5 ....6.80
KansasCity,Mo. S5 ....6.80
Pittsburgh J5 ....6.55
Youngstown U5 ....6.55

BARS, C.F., Leaded Alloy
(Including leaded extra)

Ambridge,Pa. W18 ....9.925
BeaverFalls,Pa. M12 ..9.925
Camden,N.J. P13 ....10.10
Chicago W18 ....9.925
Cleveland C20 ....9.925*
Elyria,O. W8 ....9.925
LosAngeles P2, S30 ..11.40*
Monaca,Pa. S17 ....9.925
Newark,N.J. W18 ....10.10
SpringCity,Pa. K3 ....10.10
Warren,O. C17 ....9.925

*Grade A; add 0.50c for Grade B.

BARS, Cold-Finished Carbon

Ambridge,Pa. W18 ....7.30
BeaverFalls,Pa. M12,R2 7.30
Birmingham C15 ....7.90
Buffalo B5 ....7.35
Camden,N.J. P13 ....7.75
Carnegie,Pa. C12 ....7.30
Chicago W18 ....7.30
Cleveland A7, C20 ....7.30
Detroit B5, P17 ....7.50
Detroit S41 ....7.30
Donora,Pa. A7 ....7.30
Elyria,O. W8 ....7.30
FranklinPark,Ill. N5 ....7.30
Gary,Ind. R2 ....7.30
GreenBay,Wis. F7 ....7.30
Hammond,Ind. J5, L2 ....7.30
Hartford,Conn. R2 ....7.80
Harvey,Ill. B5 ....7.30
LosAngeles(49) S30 ....8.75
LosAngeles P2, R2 ....8.75
Mansfield,Mass. B5 ....7.85
Massillon,O. R2, R8 ....7.30
Midland,Pa. C18 ....7.30
Monaca,Pa. S17 ....7.30
Newark,N.J. W18 ....7.75
NewCastle,Pa.(17) B4 ....7.30
Pittsburgh J5 ....7.30
Plymouth,Mich. P5 ....7.55
Putnam,Conn. W18 ....7.85
Readville,Mass. C14 ....7.85
S.Chicago,Ill. W14 ....7.30
SpringCity,Pa. K3 ....7.75
Struthers,O. Y1 ....7.30
Warren,O. C17 ....7.30
Willimantic,Conn. J5 ....7.80
Waukegan,Ill. A7 ....7.30
Youngstown F3, Y1 ....7.30

BARS, Cold-Finished Carbon
(Turned and Ground)

Cumberland,Md.(5) C19..6.55

BARS, Cold-Finished Alloy

Ambridge,Pa. W18 ....8.775
BeaverFalls,Pa. M12,R2 8.775
Bethlehem,Pa. B2 ....8.775
Bridgeport,Conn. C32 ..8.925
Buffalo B5 ....8.775
Camden,N.J. P13 ....8.95
Canton,O. T7 ....8.775
Carnegie,Pa. C12 ....8.775
Chicago W18 ....8.775
Cleveland A7, C20 ....8.775
Detroit B5, P17 ....8.975
Detroit S41 ....8.775
Donora,Pa. A7 ....8.775
Elyria,O. W8 ....8.775
FranklinPark,Ill. N5 ....8.775
Gary,Ind. R2 ....8.775
GreenBay, Wis. F7 ....8.775
Hammond,Ind. J5, L2 ..8.775
Hartford,Conn. R2 ....9.075
Harvey,Ill. B5 ....8.775
Lackawanna,N.Y. B2 ....8.775
LosAngeles P2, S30 ....10.75
Mansfield,Mass. B5 ....9.075
Massillon,O. R2, R8 ....8.775
Midland,Pa. C18 ....8.775
Monaca,Pa. S17 ....8.775
Newark,N.J. W18 ....8.95
Plymouth,Mich. P5 ....8.975
S.Chicago,Ill. W14 ....8.775
SpringCity,Pa. K3 ....8.95
Struthers,O. Y1 ....8.775
Warren,O. C17 ....8.775
Waukegan,Ill. A7 ....8.775
Willimantic,Conn. J5 ....9.075
Worcester,Mass. A7 ....9.075
Youngstown F3, Y1 ....8.775

BARS, Reinforcing (To Fabricators)

AlabamaCity,Ala. R2 ..5.425
Atlanta A11 .....5.425
Birmingham C15 .....5.425
Buffalo R2 .....5.425
Cleveland R2 .....5.425
Ecorse,Mich. G5 .....5.425
Emeryville,Calif. J7 ..6.175
Fairfield,Ala. T2 ....5.425
Fairless,Pa. U5 .....5.575
Fontana,Calif. K1 ....6.175
Ft.Worth,Tex.(4)(26)T4 5.875
Gary,Ind. U5 .....5.425
Houston S5 .....5.675
Ind.Harbor,Ind. I-2, Y1 5.425
Johnstown,Pa. B2 .....5.425
Joliet, Ill. P22 .....5.425
KansasCity,Mo. S5 ....5.675
Kokomo,Ind. C16 .....5.575
Lackawanna,N.Y. B2..5.425
LosAngeles B3 .....6.175
Madison,Ill. L1 .....5.625
Milton,Pa. M18 .....5.575
Minnequa,Colo. C10 ....5.875
Niles,Calif. P1 .....6.125
Pittsburg,Calif. C11 ...6.125
Pittsburgh J5 .....5.425
Portland,Oreg. O4 ....6.175
SandSprings,Okla. S5..5.925
Seattle B3, N14 .....6.175
S.Chicago,Ill. R2 .....5.425
S.Duquesne,Pa. U5 ....5.425
S.SanFrancisco B3 ....6.175
SparrowsPoint,Md. B2..5.425
Sterling,Ill.(1) N15 ...5.425
Sterling,Ill. N15 .....5.525
Struthers,O. Y1 .....5.425
Tonawanda,N.Y. B12 ..6.00
Torrance,Calif. C11 ...6.125
Youngstown R2, U5..5.425

BARS, Reinforcing (Fabricated; to Consumers)

Boston B2, U8 .....7.65
Chicago U8 .....6.91
Cleveland U8 .....6.89
Houston S5 .....7.35
Johnstown,Pa. B2 ....7.08
KansasCity,Mo. S5 ...7.35
Lackawanna,N.Y. B2 ..6.85
Marion,O. P11 .....6.10
Newark,N.J. U8 .....7.50
Philadelphia U8 .....7.38
Pittsburgh J5, U8 .....7.10
SandSprings,Okla. S5 ...7.60
Seattle B3, N14 .....7.70
SparrowsPt.,Md. B2 ...7.08
St.Paul U8 .....7.92
Williamsport,Pa. S19 ..7.00

BARS, Wrought Iron

Economy,Pa.(S.R.)B14 14.45
Economy,Pa.(D.R.)B14 18.00
Economy(Staybolt)B14 .18.45

RAIL STEEL BARS

ChicagoHts.(3) C2, I-2 5.325
ChicagoHts. (4)(44) I-2 5.425
ChicagoHts.(4) C2 ....5.425
Franklin,Pa.(3) F5 ...5.325
Franklin,Pa.(4) F5 ...5.425
JerseyShore,Pa.(3) J8 ..5.30
Marion,O.(3) P11 ....5.325
Tonawanda(3) B12 ..5.325
Tonawanda(4) B12 ....6.00
Williamsport,Pa.(3) S19 5.50

SHEETS

SHEETS, Hot-Rolled Steel (18 Gage and Heavier)

AlabamaCity,Ala. R2 ..4.925
Allenport,Pa. P7 .....4.925
Ashland,Ky.(8) A10 ...4.925
Cleveland J5, R2 .....4.925
Conshohocken,Pa. A3 ..4.975
Detroit(8) M1 .....4.925
Ecorse,Mich. G5 .....4.925
Fairfield,Ala. T2 .....4.925
Fairless,Pa. U5 .....4.975
Fontana,Calif. K1 ....5.675
Gary,Ind. U5 .....4.925
Geneva,Utah C11 ....4.925
GraniteCity,Ill.(8) G4 5.025
Ind.Harbor,Ind. I-2, Y1 4.925
Irvin,Pa. U5 .....4.925
Lackawanna,N.Y. B2 ..4.925
Mansfield,O. E6 .....4.925
Munhall,Pa. U5 .....4.925
Newport,Ky.(8) A2 ....4.925
Niles,O. M21, S3 .....4.925
Pittsburg,Calif. C11 ..5.625
Pittsburgh J5 .....4.925
Portsmouth,O. P12 ....4.925
Riverdale,Ill. A1 .....4.925
Sharon,Pa. S3 .....4.925
S.Chicago,Ill. W14 ....4.925
SparrowsPoint,Md. B2 4.925
Steubenville,O. W10 ...4.925
Warren,O. R2 .....4.925
Weirton,W.Va. W6 ....4.925
Youngstown U5, Y1 ...4.925

SHEETS, H.R. (19) Ga. & Lighter

Niles,O. M21 .....6.05

SHEETS, H.R. Alloy

Gary,Ind. U5 .....8.10
Ind.Harbor,Ind. Y1 ...8.10
Irvin,Pa. U5 .....8.10
Munhall,Pa. U5 .....8.10
Newport,Ky. A2 .....8.10
Youngstown U5, Y1 ...8.10

SHEETS, H.R. (14 Ga. & Heavier) High-Strength, Low-Alloy

Cleveland J5, R2 .....7.275
Conshohocken,Pa. A3 ..7.325
Ecorse,Mich. G5 .....7.275
Fairfield,Ala. T2 .....7.275
Fairless,Pa. U5 .....7.325
Farrell,Pa. S3 .....7.275
Fontana,Calif. K1 ....8.025
Gary,Ind. U5 .....7.275
Ind.Harbor,Ind. I-2, Y1 7.275
Irvin,Pa. U5 .....7.275
Lackawanna(35) B2 ..7.275
Munhall,Pa. U5 .....7.275
Pittsburgh J5 .....7.275
S.Chicago,Ill. U5, W14 7.275
Sharon,Pa. S3 .....7.275
SparrowsPoint(36) B2 7.275
Warren,O. R2 .....7.275
Weirton,W.Va. W6 ....7.275
Youngstown U5, Y1 ...7.275

SHEETS, Hot-Rolled Ingot Iron (18 Gage and Heavier)

Ashland,Ky.(8) A10 ..5.175
Cleveland R2 .....5.675
Warren,O. R2 .....5.675

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2 .....6.80
Middletown,O. A10 ....6.55
Warren,O. R2 .....6.80

SHEETS, Cold-Rolled Steel (Commercial Quality)

AlabamaCity,Ala. R2 ..6.05
Allenport,Pa. P7 .....6.05
Cleveland J5, R2 .....6.05
Conshohocken,Pa. A3 ..6.10
Detroit M1 .....6.05
Ecorse,Mich. G5 .....6.05
Fairfield,Ala. T2 .....6.05
Fairless,Pa. U5 .....6.10
Follansbee,W.Va. F4 ...6.05
Fontana,Calif. K1 ....7.30
Gary,Ind. U5 .....6.05
GraniteCity,Ill. G4 ....6.15
Ind.Harbor,Ind. I-2, Y1 6.05
Irvin,Pa. U5 .....6.05
Lackawanna,N.Y. B2 ..6.05
Mansfield,O. E6 .....6.05
Middletown,O. A10 ....6.05
Newport,Ky. A2 .....6.05
Pittsburg,Calif. C11....7.00
Pittsburgh J5 .....6.05
Portsmouth,O. P12 ....6.05
SparrowsPoint,Md. B2..6.05
Steubenville,O. W10 ....6.05
Warren,O. R2 .....6.05
Weirton,W.Va. W6 ....6.05
Yorkville,O. W10 .....6.05
Youngstown Y1 .....6.05

SHEETS, Cold-Rolled, High-Strength, Low Alloy

Cleveland J5, R2 ....8.975
Ecorse,Mich. G5 .....8.975
Fairless,Pa. U5 .....9.025
Fontana,Calif. K1 ..10.275
Gary,Ind. U5 .....8.975
IndianaHarbor,Ind. Y1 8.975
Irvin,Pa. U5 .....8.975
Lackawanna(37) B2 ..8.975
Pittsburgh J5 .....8.975
SparrowsPoint(38) B2..8.975
Warren,O. R2 .....8.975
Weirton,W.Va. W6 ....8.975
Youngstown Y1 .....8.975

SHEETS, Culvert

	Cu Steel	Cu Fe
Ashland,Ky. A10	6.95	7.20
Canton,O. R2	6.95	7.45
Fairfield T2	6.95	7.20
Gary,Ind. U5	6.95	7.20
GraniteCity,Ill. G4	7.05	...
Ind.Harbor I-2	6.95	7.20
Irvin,Pa. U5	6.95	7.20
Kokomo,Ind. C16	7.05	...
MartinsFry. W10	6.95	7.20
Pitts.,Calif. C11	7.70	...
Pittsburgh J5	6.95	...
SparrowsPt. B2	6.95	...

SHEETS, Culvert—Pure Iron

Ind.Harbor,Ind. I-2 ....7.20

SHEETS, Galvanized Steel Hot-Dipped

AlabamaCity,Ala. R2..6.60‡
Ashland,Ky. A10 ....6.60†
Canton,O. R2 .....6.60‡
Dover,O. E6 .....6.60†
Fairfield,Ala. T2 ....6.60†
Gary,Ind. U5 .....6.60†
GraniteCity,Ill. G4 ....6.70*
Ind.Harbor,Ind. I-2....6.60†
Irvin,Pa. U5 .....6.60†
Kokomo,Ind. C16 ....6.70‡
MartinsFerry,O. W10 ..6.60*
Middletown,O. A10 ....6.60†
Pittsburg,Calif. C11 ...7.35*
Pittsburgh J5 .....6.60†
SparrowsPt.,Md. B2 ..6.60†
Warren,O. R2 .....6.60†
Weirton,W.Va. W6 ....6.60*

*Continuous and noncontinuous. †Continuous. ‡Noncontinuous.

SHEETS, Well Casing

Fontana,Calif. K1 ....7.175

SHEETS, Galvanized High-Strength, Low-Alloy

Irvin,Pa. U5 .....9.725
SparrowsPt.(39) B2 ..9.725
Pittsburgh J5 .....9.725

SHEETS, Galvannealed Steel

Canton,O. R2 .....7.00
Irvin,Pa. U5 .....7.00

SHEETS, Galvanized Ingot Iron (Hot-Dipped Continuous)

Ashland,Ky. A10 .....6.85
Middletown,O. A10 ....6.85

SHEETS, Electrogalvanized

Cleveland(28) R2 ....7.425
Niles,O.(28) R2 .....7.425
Youngstown J5 .....7.275
Weirton,W.Va. W6 ....7.275

SHEETS, Aluminum Coated

Butler,Pa. A10 (type 1) 9.25
Butler,Pa. A10 (type 2) 9.35

SHEETS, Enameling Iron

Ashland,Ky. A10 .....6.625
Cleveland R2 .....6.625
Fairfield,Ala. T2 .....6.625
Gary,Ind. U5 .....6.625
GraniteCity,Ill. G4 ....6.725
Ind.Harbor,Ind. I-2, Y1 6.625
Irvin,Pa. U5 .....6.625
Middletown,O. A10 ....6.625
Niles,O. M21, S3 .....6.625
Youngstown Y1 .....6.625

BLUED STOCK, 29 Gage

Follansbee,W.Va. F4 ..8.65
Ind.Harbor,Ind. I-2 ..8.475
Yorkville,O. W10 .....8.475

SHEETS, Long Terne, Steel (Commercial Quality)

BeechBottom,W.Va. W10 7.00
Gary,Ind. U5 .....7.00
Mansfield,O. E6 .....7.00
Middletown,O. A10 ....7.00
Niles,O. M21, S3 .....7.00
Warren,O. R2 .....7.00
Weirton,W.Va. W6 ....7.00

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10 ....7.40

Key To Producers

A1 Acme Steel Co.
A2 Acme-Newport Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Div., H. K. Porter Co. Inc.
A6 American Shim Steel Co.
A7 American Steel & Wire Div., U. S. Steel Corp.
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke, Wickwire Spencer Steel Div., Colo. Fuel & Iron
B11 Buffalo Bolt Co., Div., Buffalo Eclipse Corp.
B12 Buffalo Steel Corp.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div., Borg-Warner Corp.
C4 Carpenter Steel Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C15 Connors Steel Div. H. K. Porter Co. Inc.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Plant, Wickwire Spencer Steel Div., Colo. Fuel & Iron
C23 Charter Wire Inc.
C24 G. O. Carlson Inc.
C32 Carpenter Steel of N.Eng.

D2 Detroit Steel Corp.
D3 Dearborn Div., Sharon Steel Corp.
D4 Disston Div., H. K. Porter Co. Inc.
D6 Driver-Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.

E1 Eastern Gas&FuelAssoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire-Reeves Steel Corp.

F2 Firth Sterling Inc.
F3 Fitzsimmons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc

G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.
G8 Green River Steel Corp.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-6 Ivins Steel Tube Works
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel& Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L6 Lone Star Steel Co.
L7 Lukens Steel Co.
L8 Leschen Wire Rope Div., H. K. Porter Co. Inc.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M14 McInnes Steel Co.
M16 Md.Fine&Special.Wire
M17 Metal Forming Corp.
M18 Milton Steel Div., Merritt-Chapman&Scott
M21 Mallory-Sharon Metals Corp.
M22 Mill Strip Products Co.
N1 National-Standard Co.
N2 National Supply Co.
N3 National Tube Div., U. S. Steel Corp.
N5 Nelsen Steel & Wire Co.
N6 New England High Carbon Wire Co.
N8 Newman-Crosby Steel
N14 Northwest. Steel Rolling Mills Inc.
N15 Northwestern S.&W.Co.
N20 Neville Ferro Alloy Co.
O4 Oregon Steel Mills
P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co., Sub. of Barium Steel Corp.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Div., Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., American Chain & Cable
P17 Plymouth Steel Corp.
P19 Pitts. Rolling Mills
P20 Prod. Steel Strip Corp.
P22 Phoenix Mfg. Co.
P24 Phil. Steel & Wire Corp.

R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R8 Reliance Div., Eaton Mfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Div., Armco Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S12 Spencer Wire Corp.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S17 Superior Drawn Steel Co.
S18 Superior Steel Div., Copperweld Steel Co.
S19 Sweet's Steel Co.
S20 Southern States Steel
S23 Superior Tube Co.
S25 Stainless Welded Prod.
S26 Specialty Wire Co. Inc.
S30 Sierra Drawn Steel Corp.
S40 Seneca Steel Service
S41 Stainless Steel Div., J&L Steel Corp.
S42 Southern Elec. Steel Co.
T2 Tenn. Coal & Iron Div., U. S. Steel Corp.
T3 Tenn. Products & Chemical Corp.
T4 Texas Steel Co.
T5 Thomas Strip Div., Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div., Am. Rad. & Stan. San.
T13 Tube Methods Inc.
T19 Techalloy Co. Inc.
U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U. S. Pipe & Foundry
U7 Ulbrich Stainless Steels
U8 U. S. Steel Supply Div., U. S. Steel Corp.
V2 Vanadium-Alloys Steel
V3 Vulcan-Kidd Steel Div., H. K. Porter Co.
W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W8 Western Automatic Machine Screw Co.
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.
Y1 Youngstown Sheet & Tube

STRIP

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2	4.925
Allenport,Pa. P7	4.925
Alton, Ill. L1	5.125
Ashland,Ky.(8) A10	4.925
Atlanta A11	4.925
Bessemer,Ala. T2	4.925
Birmingham C15	4.925
Buffalo(27) R2	4.925
Conshohocken,Pa. A3	4.975
Detroit M1	5.025
Ecorse,Mich. G5	4.925
Fairfield,Ala. T2	4.925
Fontana,Calif. K1	5.675
Gary,Ind. U5	4.925
Ind.Harbor,Ind. I-2, Y1	4.925
Johnstown,Pa.(25) B2	4.925
Lackaw'na,N.Y.(25) B2	4.925
LosAngeles(25) B3	5.675
Minnequa,Colo. C10	6.025
Riverdale,Ill. A1	4.925
SanFrancisco S7	6.35
Seattle(25) B3	5.925
Seattle N14	6.35
Sharon,Pa. S3	4.925
S.Chicago W14	4.925
S.SanFrancisco(25) B3	5.675
SparrowsPoint,Md. B2	4.925
Sterling,Ill.(1) N15	4.925
Sterling,Ill. N15	5.025
Torrance,Calif. C11	5.675
Warren,O. R2	4.925
Weirton,W.Va. W6	4.925
Youngstown U5	4.925

STRIP, Hot-Rolled Alloy

Carnegie,Pa. S18	8.10
Farrell,Pa. S3	8.10
Gary,Ind. U5	8.10
Houston S5	8.35
Ind.Harbor,Ind. Y1	8.10
KansasCity,Mo. S5	8.35
LosAngeles B3	9.30
Lowellville,O. S3	8.10
Newport,Ky. A2	8.10
Sharon,Pa. A2, S3	8.10
S.Chicago,Ill. W14	8.10
Youngstown U5, Y1	8.10

STRIP, Hot-Rolled High-Strength, Low-Alloy

Bessemer,Ala. T2	7.325
Conshohocken,Pa. A3	7.325
Ecorse,Mich. G5	7.325
Fairfield,Ala. T2	7.325
Farrell,Pa. S3	7.325
Gary,Ind. U5	7.325
Ind.Harbor,Ind. I-2, Y1	7.325
Lackawanna,N.Y. B2	7.325
LosAngeles(25) B3	8.075
Seattle(25) B3	8.325
Sharon,Pa. S3	7.325
S.Chicago,Ill. W14	7.325
S.SanFrancisco(25) B3	8.075
SparrowsPoint,Md. B2	7.325
Warren,O. R2	7.325
Weirton,W.Va. W6	7.325
Youngstown U5, Y1	7.325

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10	5.175
Warren,O. R2	5.675

STRIP, Cold-Rolled Carbon

Anderson,Ind. G6	7.15
Baltimore T6	7.15
Boston T6	7.70
Buffalo S40	7.15
Cleveland A7, J5	7.15
Dearborn,Mich. D3	7.15
Detroit D2, M1, P20	7.15
Dover,O. G6	7.15
Ecorse,Mich. G5	7.15
Evanston,Ill. M22	7.25
Follansbee,W.Va. F4	7.15
Fontana,Calif. K1	9.00
FranklinPark,Ill. T6	7.25
Ind.Harbor,Ind. Y1	7.15
Indianapolis J5	7.30
LosAngeles J5	9.05
LosAngeles C1	9.20
NewBedford,Mass. R10	7.60
NewBritain,Conn. S15	7.60
NewCastle,Pa. B4, E5	7.15
NewHaven,Conn. D2	7.60
NewKensington,Pa. A6	7.15
Pawtucket,R.I. R3	7.80
Pawtucket,R.I. N8	7.70
Philadelphia P24	7.70
Pittsburgh J5	7.15
Riverdale,Ill. A1	7.25
Rome,N.Y.(32) R6	7.15
Sharon,Pa. S3	7.15
Trenton,N.J.(31) R5	8.60
Wallingford,Conn. W2	7.60
Warren O. R2, T5	7.15
Weirton,W.Va. W6	7.15
Worcester,Mass. A7	7.70
Youngstown J5, Y1	7.15

STRIP, Cold-Rolled Alloy

Boston T6	15.40
Carnegie,Pa. S18	15.05
Cleveland A7	15.05
Dover,O. G6	15.05
Farrell,Pa. S3	15.05
FranklinPark,Ill. T6	15.05
Harrison,N.J. C18	15.05
Indianapolis J5	15.20
Lowellville,O. S3	15.05
Pawtucket,R.I. N8	15.40
Riverdale,Ill. A1	15.05
Sharon,Pa. S3	15.05
Worcester,Mass. A7	15.35
Youngstown J5	15.05

STRIP, Cold-Rolled High-Strength, Low-Alloy

Cleveland A7	10.45
Dearborn,Mich. D3	10.60
Dover,O. G6	10.45
Ecorse,Mich. G5	10.50
Farrell,Pa. S3	10.50
Ind.Harbor,Ind. Y1	10.65
Sharon,Pa. S3	10.50
Warren,O. R2	10.45

STRIP, Cold-Finished Spring Steel (Annealed)	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Baltimore T6	9.50	10.70	12.90	15.90	18.85
Boston T6	9.50	10.70	12.90	15.90	18.85
Bristol,Conn. W1	...	10.70	12.90	16.10	19.30
Carnegie,Pa. S18	8.95	10.40	12.60	15.60	....
Cleveland A7	8.95	10.40	12.60	15.60	18.55
Dearborn,Mich. D3	9.05	10.50	12.70	....	....
Detroit D2	9.05	10.50	12.70	15.70	....
Dover,O. G6	8.95	10.40	12.60	15.60	18.55
Evanston,Ill. M22	8.95	10.40	12.60	15.60	....
Fostoria,O. S1	10.05	10.40	12.60	15.60	....
FranklinPark,Ill. T6	9.05	10.40	12.60	15.60	18.55
Harrison,N.J. C18	....	....	12.90	16.10	19.30
Indianapolis J5	9.10	10.55	12.60	15.60	18.55
LosAngeles C1	11.15	12.60	14.80	17.80	....
LosAngeles J5	11.15	12.60	14.80	....	....
NewBritain,Conn. S15	9.40	10.70	12.90	15.90	18.85
NewCastle,Pa. B4, E5	8.95	10.40	12.60	15.60	....
NewHaven,Conn. D2	9.40	10.70	12.90	15.90	....
NewKensington,Pa. A6	8.95	10.40	12.60	15.60	....
NewYork W3	...	10.70	12.90	16.10	19.30
Pawtucket,R.I. N8	9.50	10.70	12.90	15.90	18.85
Riverdale,Ill. A1	9.05	10.40	12.60	15.60	18.55
Rome,N.Y.(32) R6	8.95	10.40	12.60	15.60	18.55
Sharon,Pa. S3	8.95	10.40	12.60	15.60	18.55
Trenton,N.J. R5	....	10.70	12.90	16.10	19.30
Wallingford,Conn. W2	9.40	10.70	12.90	15.90	18.75
Warren,O. T5	8.95	10.40	12.60	15.60	18.55
Worcester,Mass. A7, T6	9.50	10.70	12.90	15.90	18.85
Youngstown J5	8.95	10.40	12.60	15.60	18.55

Spring Steel (Tempered)	Up to 0.80C	0.81-1.05C	1.06-1.35C
Bristol,Conn. W1	18.10	21.95	26.30
Buffalo W12	18.10	....	....
Fostoria,O. S1	18.30	22.15	....
FranklinPark,Ill. T6	18.45	22.30	26.65
Harrison,N.J. C18	18.10	21.95	26.30
NewYork W3	18.10	21.95	26.30
Palmer,Mass. W12	18.10	....	....
Trenton,N.J. R5	18.10	21.95	26.30
Worcester,Mass. A7, T6	18.10	21.95	26.30
Youngstown J5	18.45	22.30	26.65

Weirton,W.Va. W6 ....10.50
Youngstown Y1 .....10.65

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2 .....7.90

STRIP, C.R. Electrogalvanized

Cleveland A7	7.15*
Dover,O. G6	7.15*
Evanston,Ill. M22	7.25*
Riverdale,Ill. A1	7.25*
Warren,O. B9, T5	7.15*
Worcester,Mass. A7	7.70*
Youngstown J5	7.15*

*Plus galvanizing extras.

STRIP, Galvanized (Continuous)

Sharon,Pa. S3 .....7.275

TIGHT COOPERAGE HOOP

Atlanta A11	5.65
Riverdale,Ill. A1	5.50
Sharon,Pa. S3	5.35
Youngstown U5	5.35

SILICON STEEL

H.R. SHEETS(22 Ga., cut lengths)	Field	Armature	Electric	Motor	Dynamo
BeechBottom,W.Va. W10	....	....	11.80	12.90	13.95
Mansfield,O. E6	9.625	11.10	11.80	12.90	13.95
Newport,Ky. A2	9.625	11.10	11.80	12.90	13.95
Niles,O. M21, S3	9.625	11.10	11.80	12.90	....
Vandergrift,Pa. U5	....	11.10	11.80	12.90	13.95
Warren,O. R2	9.625	11.10	11.80	12.90	....
Zanesville,O. A10	....	11.10	11.80	12.90	13.95

C.R. COILS & CUT LENGTHS (22 Ga.)

Fully Processed (Semiprocessed ½c lower)	Field	Armature	Electric	Motor	Dynamo
BeechBottom,W.Va. W10	....	11.35	12.05	13.15	14.20
Brackenridge,Pa. A4	....	....	12.05	13.15	14.20
GraniteCity,Ill. G4	9.725*	10.95*	11.65*	12.75*	....
IndianaHarbor,Ind. I-2	9.625†	10.85*	11.55*	12.65*	....
Mansfield,O. E6	9.625*	11.35	12.05	13.15	14.20
Vandergrift,Pa. U5	9.625*	11.35	12.05	13.15	14.20
Warren,O. R2	9.625*	11.35	12.05	13.15	14.20
Zanesville,O. A10	....	11.35†	12.05	13.15	14.20
					Stator
Vandergrift,Pa. U5	....	....	....	....	7.85

H.R. SHEETS (22 Ga., cut lengths)	T-72	T-65	T-58	T-52
BeechBottom,W.Va. W10	15.00	15.55	16.05	17.10
Vandergrift,Pa. U5	15.00	15.50	16.05	17.10
Zanesville,O. A10	15.00	15.55	16.05	17.10

C.R. COILS & CUT LENGTHS (22 Ga.)	Grain Oriented T-100	T-90	T-80	T-73	T-66	T-72
Brackenridge,Pa. A4	....	17.60	19.20	19.70	20.20	15.25††
Butler,Pa. A10	....	....	....	19.20	19.70	20.20
Vandergrift,Pa. U5	..	16.60	17.60	19.20	19.70	20.20
Warren,O. R2	....	....	....	....	....	15.25‡

*Semiprocessed. †Fully processed only. ‡Coils, annealed, semiprocessed ½c lower. **Cut lengths, ¾-cent lower. ††Coils only.

TIN MILL PRODUCTS

TIN PLATE, Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$8.75	$9.00	$9.40
Fairfield,Ala. T2	8.85	9.10	9.50
Fairless,Pa. U5	8.85	9.10	9.50
Fontana,Calif. K1	9.50	9.75	10.15
Gary,Ind. U5	8.75	9.00	9.40
GraniteCity,Ill. G4	8.85	9.10	9.50
IndianaHarbor,Ind. I-2, Y1	8.75	9.00	9.40
Irvin,Pa. U5	8.75	9.00	9.40
Niles,O. R2	8.75	9.00	9.40
Pittsburg,Calif. C11	9.50	9.75	10.15
SparrowsPoint,Md. B2	8.85	9.10	9.50
Weirton,W.Va. W6	8.75	9.00	9.40
Yorkville,O. W10	8.75	9.00	9.40

ELECTROTIN (22-27 Gage; Dollars per 100 lb)			
Aliquippa,Pa. J5	7.725	7.925	....
Niles,O. R2	7.725	7.925	8.125

TIN PLATE, American	1.25 lb	1.50 lb
Aliquippa,Pa. J5	$10.05	$10.30
Fairfield,Ala. T2	10.15	10.40
Fairless,Pa. U5	10.15	10.40
Fontana,Calif. K1	10.80	11.05
Gary,Ind. U5	10.05	10.30
Ind.Harb. Y1	10.05	10.30
Pitts.,Calif. C11	10.80	11.05
Sp.Pt.,Md. B2	10.15	10.40
Weirton,W.Va. W6	10.05	10.30
Yorkville,O. W10	10.05	10.30

BLACK PLATE (Base Box)

Aliquippa,Pa. J5	$7.85
Fairfield,Ala. T2	7.95
Fairless,Pa. U5	7.95
Fontana,Calif. K1	8.60
Gary,Ind. U5	7.85
GraniteCity,Ill. G4	7.95
Ind.Harbor,Ind. I-2, Y1	7.85
Irvin,Pa. U5	7.85
Niles,O. R2	7.85
Pittsburg,Calif. C11	8.60
SparrowsPoint,Md. B2	7.95
Weirton,W.Va. W6	7.85
Yorkville,O. W10	7.85

HOLLOWARE ENAMELING Black Plate (29 Gage)

Aliquippa,Pa. J5	$7.50
Gary,Ind. U5	7.50
GraniteCity,Ill. G4	7.60
Ind.Harbor,Ind. Y1	7.50
Irvin,Pa. U5	7.50
Yorkville,O. W10	7.50

MANUFACTURING TERNES (Special Coated, Base Box)

Gary,Ind. U5	$9.70
Irvin,Pa. U5	9.70

ROOFING SHORT TERNES (8 lb Coated, Base Box)

Gary,Ind. U5	$11.25

WIRE

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2	7.65
Aliquippa,Pa. J5	7.65
Alton,Ill. L1	7.85
Atlanta A11	7.65
Bartonville,Ill. K4	7.75
Buffalo W12	7.65
Chicago W13	7.65
Cleveland A7, C20	7.65
Crawfordsville,Ind. M8	7.75
Donora,Pa. A7	7.65
Duluth A7	7.65
Fairfield,Ala. T2	7.65
Fostoria,O.(24) S1	7.75
Houston S5	7.90
Jacksonville,Fla. M8	8.00
Johnstown,Pa. B2	7.65
Joliet,Ill. A7	7.65
KansasCity,Mo. S5	7.90
Kokomo,Ind. C16	7.75
LosAngeles B3	8.60
Minnequa,Colo. C10	7.90
Monessen,Pa. P7, P16	7.65
N.Tonawanda,N.Y. B11	7.65
Palmer,Mass. W12	7.95
Pittsburg,Calif. C11	8.60
Portsmouth,O. P12	7.65
Rankin,Pa. A7	7.65
S.Chicago,Ill. R2	7.65
S.SanFrancisco C10	8.60
SparrowsPoint,Md. B2	7.75
Sterling,Ill.(1) N15	7.65
Sterling,Ill. N15	7.75
Struthers,O. Y1	7.65
Waukegan,Ill. A7	7.65
Worcester,Mass. A7	7.95

WIRE, Gal'd., for ACSR

Bartonville,Ill. K4	12.65
Buffalo W12	12.65
Cleveland A7	12.65
Donora,Pa. A7	12.65
Duluth A7	12.65
Johnstown,Pa. B2	12.65
Minnequa,Colo. C10	12.775
Monessen,Pa. P7, P16	12.65
Muncie,Ind. I-7	12.85
NewHaven,Conn. A7	12.95
Palmer,Mass. W12	12.95
Pittsburg,Calif. C11	13.45
Portsmouth,O. P12	12.65
Roebling,N.J. R5	12.95
SparrowsPt.,Md. B2	12.75
Struthers,O. Y1	12.65
Trenton,N.J. A7	12.95
Waukegan,Ill. A7	12.65
Worcester,Mass. A7	12.95

WIRE, Upholstery Spring

Aliquippa,Pa. J5	9.30
Alton,Ill. L1	9.50
Buffalo W12	9.30
Cleveland A7	9.30
Donora,Pa. A7	9.30
Duluth A7	9.30
Johnstown,Pa. B2	9.30
KansasCity,Mo. S5	9.55
LosAngeles B3	10.25
Minnequa,Colo. C10	9.50
Monessen,Pa. P7, P16	9.30
NewHaven,Conn. A7	9.60
Palmer,Mass. W12	9.60
Pittsburg,Calif. C11	10.25
Portsmouth,O. P12	9.30
Roebling,N.J. R5	9.60
S.Chicago,Ill. R2	9.30
S.SanFrancisco C10	10.25
SparrowsPt.,Md. B2	9.40
Struthers,O. Y1	9.30
Trenton,N.J. A7	9.60
Waukegan,Ill. A7	9.30
Worcester,Mass. A7	9.60

WIRE, MB Spring, High-Carbon

Aliquippa,Pa. J5	9.30
Alton,Ill. L1	9.50
Bartonville,Ill. K4	9.40
Buffalo W12	9.30
Cleveland A7	9.30
Donora,Pa. A7	9.30
Duluth A7	9.30
Fostoria,O. S1	9.35
Johnstown,Pa. B2	9.30
KansasCity,Mo. S5	9.55
LosAngeles B3	10.25
Milbury,Mass.(12) N6	9.60
Minnequa,Colo. C10	9.50
Monessen,Pa. P7, P16	9.30
Muncie,Ind. I-7	9.50
Palmer,Mass.(12) W12	9.60
Pittsburg,Calif. C11	10.25
Portsmouth,O. P12	9.30
Roebling,N.J. R5	9.60
S.Chicago,Ill. R2	9.30
S.SanFrancisco C10	10.25
SparrowsPt.,Md. B2	9.40
Struthers,O. Y1	9.30
Trenton,N.J. A7	9.60
Waukegan,Ill. A7	9.30
Worcester,Mass. A7, J4, T6	9.60

WIRE, Fine & Weaving(8" Coils)

Alton,Ill. L1	15.80
Bartonville,Ill. K4	15.70
Buffalo W12	15.60
Chicago W13	15.60
Cleveland A7	15.60
Crawfordsville,Ind. M8	15.70
Fostoria,O. S1	15.60
Houston S5	15.85
Jacksonville,Fla. M8	15.95
Johnstown,Pa. B2	15.60
KansasCity,Mo. S5	15.85
Kokomo,Ind. C16	15.60
Minnequa,Colo. C10	15.85
Monessen,Pa. P16	15.60
Muncie,Ind. I-7	15.80
Palmer,Mass. W12	15.90
S.SanFrancisco C10	16.45
Waukegan,Ill. A7	15.60
Worcester,Mass. A7, T6	15.90

ROPE WIRE	(A)
Bartonville,Ill. K4	12.75
Buffalo W12	12.75
Fostoria,O. S1	12.75
Johnstown,Pa. B2	12.75
Monessen,Pa. P7	12.75
Muncie,Ind. I-7	12.95
Palmer,Mass. W12	13.05
Portsmouth,O. P12	12.75
Roebling,N.J. R5	13.05
St. Louis L8	12.75
SparrowsPt.,Md. B2	12.85
Struthers,O. Y1	12.75
Worcester,Mass. J4	13.05

(A) Plow and Mild Plow; add 0.25c for Improved Plow

WIRE, Tire Bead

Bartonville,Ill. K4	16.55
Monessen,Pa. P16	16.55
Roebling,N.J. R5	17.05

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	11.65
Baltimore T6	11.95
Boston T6	11.95
Buffalo W12	11.65
Chicago W13	11.75
Cleveland A7	11.65
Crawfordsville,Ind. MS	11.65
Dover,O. G6	11.65
Fostoria,O. S1	11.65
FranklinPark,Ill. T6	11.75
Kokomo,Ind. C16	11.65
Massillon,O. R8	11.65
Milwaukee C23	11.85
Monessen,Pa. P7, P16	11.65
Palmer,Mass. W12	11.95
Pawtucket,R.I. NS	11.95
Philadelphia P24	11.95
Riverdale,Ill. A1	11.75
Rome,N.Y. R6	11.65
Sharon,Pa. S3	11.65
Trenton,N.J. R5	11.95
Warren O. B9	11.65
Worcester,Mass. A7, T6	11.95

NAILS, Stock	Colo.
AlabamaCity,Ala. R2	173
Aliquippa,Pa. J5	173
Atlanta A11	175
Bartonville,Ill. K4	175
Chicago W13	173
Cleveland A9	173
Crawfordsville,Ind. MS	175
Donora,Pa. A7	173
Duluth A7	173
Fairfield,Ala. T2	173
Houston S5	178
Jacksonville,Fla. MS	175
Johnstown,Pa. B2	173
Joliet,Ill. A7	173
KansasCity,Mo. S5	178
Kokomo,Ind. C16	175
Minnequa,Colo. C10	178
Monessen,Pa. P7	173
Pittsburg,Calif. C11	192
Rankin,Pa. A7	173
S.Chicago,Ill. R2	173
SparrowsPt.,Md. B2	175
Sterling,Ill.(7) N15	175
Worcester,Mass. A7	179
(To Wholesalers; per cwt)	
Galveston,Tex. D7	$9.10

NAILS, Cut (100 lb keg) To Dealers (33)	
Conshohocken,Pa. A3	$9.80
Wheeling,W.Va. W10	9.80

POLISHED STAPLES	Col.
AlabamaCity,Ala. R2	175
Aliquippa,Pa. J5	175
Atlanta A11	177
Bartonville,Ill. K4	177
Crawfordsville,Ind. MS	177
Donora,Pa. A7	175
Duluth A7	175
Fairfield,Ala. T2	175
Houston S5	180
Jacksonville,Fla. MS	177
Johnstown,Pa. B2	175
Joliet,Ill. A7	175
KansasCity,Mo. S5	180
Kokomo,Ind. C16	177
Minnequa,Colo. C10	180
Pittsburg,Calif. C11	194
Rankin,Pa. A7	175
S.Chicago,Ill. R2	175
SparrowsPt.,Md. B2	177
Sterling,Ill.(7) N15	175
Worcester,Mass. A7	181

TIE WIRE, Automatic Baler (14½ Ga.) (per 97 lb Net Box)

Coil No. 3150	
AlabamaCity,Ala. R2	$10.26
Atlanta A11	10.36
Bartonville,Ill. K4	10.36
Buffalo W12	10.26
Chicago W13	10.26
Crawfordsville,Ind. MS	10.36
Donora,Pa. A7	10.26
Duluth A7	10.26
Fairfield,Ala. T2	10.26
Houston S5	10.51
Jacksonville,Fla. MS	10.36
Johnstown,Pa. B2	10.26
Joliet,Ill. A7	10.26
KansasCity,Mo. S5	10.51
Kokomo,Ind. C16	10.36
LosAngeles B3	11.05
Minnequa,Colo. C10	10.51
Pittsburg,Calif. C11	11.04
S.Chicago,Ill. R2	10.26
S.SanFrancisco C10	11.04
SparrowsPt.,Md. B2	10.36
Sterling,Ill.(37) N15	10.36
Coil No. 6500 Stand.	
AlabamaCity,Ala. R2	$10.60
Atlanta A11	10.70
Bartonville,Ill. K4	10.70
Buffalo W12	10.60
Chicago W13	10.60
Crawfordsville,Ind. MS	10.70
Donora,Pa. A7	10.60
Duluth A7	10.60
Fairfield,Ala. T2	10.60
Houston S5	10.85
Jacksonville,Fla. MS	10.70
Johnstown,Pa. B2	10.60
Joliet,Ill. A7	10.60
KansasCity,Mo. S5	10.85
Kokomo,Ind. C16	10.70
LosAngeles B3	11.40
Minnequa,Colo. C10	10.85
Pittsburg,Calif. C11	11.40
S.Chicago,Ill. R2	10.60
S.SanFrancisco C10	11.40
SparrowsPt.,Md. B2	10.70
Sterling,Ill.(37) N15	10.70

Coil No. 6500 Interim	
AlabamaCity,Ala. R2	$10.65
Atlanta A11	10.75
Bartonville,Ill. K4	10.75
Buffalo W12	10.65
Chicago W13	10.65
Crawfordsville,Ind. MS	10.75
Donora,Pa. A7	10.65
Duluth A7	10.65
Fairfield,Ala. T2	10.65
Houston S5	10.90
Jacksonville,Fla. MS	10.75
Johnstown,Pa. B2	10.65
Joliet,Ill. A7	10.65
KansasCity,Mo. S5	10.90
Kokomo,Ind. C16	10.75
LosAngeles B3	11.45
Minnequa,Colo. C10	10.90
Pittsburg,Calif. C11	11.45
S.Chicago,Ill. R2	10.65
S.SanFrancisco C10	11.45
SparrowsPt.,Md. B2	10.75
Sterling,Ill.(37) N15	10.75

BALE TIES, Single Loop	Col.
AlabamaCity,Ala. R2	212
Atlanta A11	214
Bartonville,Ill. K4	214
Crawfordsville,Ind. MS	214
Donora,Pa. A7	212
Duluth A7	212
Fairfield,Ala. T2	212
Houston S5	217
Jacksonville,Fla. MS	214
Joliet,Ill. A7	212
KansasCity,Mo. S5	217
Kokomo,Ind. C16	214
Minnequa,Colo. C10	217
Pittsburg,Calif. C11	236
S.SanFrancisco C10	236
SparrowsPt.,Md. B2	214
Sterling,Ill.(7) N15	214

FENCE POSTS	
Birmingham C15	172
ChicagoHts.,Ill. C2, I-2	172
Duluth A7	172
Franklin,Pa. F5	172
Huntington,W.Va. C15	172
Johnstown,Pa. B2	172
Marion,O. P11	172
Minnequa,Colo. C10	177
Sterling,Ill.(1) N15	172
Tonawanda,N.Y. B12	174

WIRE, Barbed	Col.
AlabamaCity,Ala. R2	193**
Aliquippa,Pa. J5	190§
Atlanta A11	198*
Bartonville,Ill. K4	198
Crawfordsville,Ind. MS	198
Donora,Pa. A7	193†
Duluth A7	193†
Fairfield,Ala. T2	193†
Houston S5	198**
Jacksonville,Fla. MS	198
Johnstown,Pa. B2	196§
Joliet,Ill. A7	193†
KansasCity,Mo. S5	198**
Kokomo,Ind. C16	195†
Minnequa,Colo. C10	198**
Monessen,Pa. P7	196§
Pittsburg,Calif. C11	213†
Rankin,Pa. A7	193†
S.Chicago,Ill. R2	193**
S.SanFrancisco C10	213*
SparrowsPoint,Md. B2	198§
Sterling,Ill.(7) N15	198††

WOVEN FENCE, 9-15 Ga.	Col.
Ala.City,Ala. R2	187**
Aliq'ppa,Pa.9-14½ga.J5	190§
Atlanta A11	192*
Bartonville,Ill. K4	192
Crawfordsville,Ind. MS	192
Donora,Pa. A7	187†
Duluth A7	187†
Fairfield,Ala. T2	187†
Houston S5	192**
Jacksonville,Fla. MS	192
Johnstown,Pa.(43) B2	190§
Joliet,Ill. A7	187†
KansasCity,Mo. S5	192**
Kokomo,Ind. C16	189†
Minnequa,Colo. C10	192**
Pittsburg,Calif. C11	210†
Rankin,Pa. A7	187†
S.Chicago,Ill. R2	187**
Sterling,Ill.(7) N15	192††

WIRE (16 gage)	An'ld Stone	Galv. Stone
Ala.City,Ala.R2	17.15	18.70**
Aliq'ppa,Pa. J5	17.15	18.95
Bartonville K4	17.25	19.05
Cleveland A7	17.15	....
Craw'dsville MS	17.25	19.05
Fostoria,O. S1	17.65	19.20†
Houston S5	17.40	18.95**
Jacksonville MS	17.25	19.05
Johnstown B2	17.15	18.95§
Kan.City,Mo. S5	17.40	....
Kokomo C16	17.25	18.80†
Minnequa C10	17.40	18.95**
P'lm'r,Mass.W12	17.45	19.00†
Pitts.,Calif. C11	17.50	19.05†
SparrowsPt. B2	17.25	19.05§
Sterling(37)N15	17.25	19.05††
Waukegan A7	17.15	18.70†
Worcester A7	17.45	....

WIRE, Merchant Quality (6 to 8 gage)	An'ld	Galv.
Ala.City,Ala. R2	8.65	9.20**
Aliquippa J5	8.65	9.325§
Atlanta(48) A11	8.75	9.425*
Bartonville(48) K4	8.75	9.425
Buffalo W12	8.65	9.20†
Cleveland A7	8.65	....
Crawfordsville MS	8.75	9.425
Donora,Pa. A7	8.65	9.20†
Duluth A7	8.65	9.20†
Fairfield T2	8.65	9.20†
Houston(48) S5	8.90	9.45**
Jacks'ville,Fla. MS	8.75	9.425
Johnstown B2(48)	8.65	9.325§
Joliet,Ill. A7	8.65	9.20†
Kans.City(48) S5	8.90	9.45**
Kokomo C16	8.75	9.30†
LosAngeles B3	9.60	10.275§
Minnequa C10	8.90	9.45**
Monessen P7(48)	8.65	9.325§
Palmer,Mass. W12	8.55	9.50†
Pitts.Calif. C11	9.60	10.15†
Rankin,Pa. A7	8.65	9.20†
S.Chicago R2	8.65	9.20**
S.SanFran. C10	9.60	10.15**
Spar'wsPt.B2(48)	8.75	9.425§
Sterling(48) N15	8.90	9.575††
Sterling(1) (48)	8.80	9.475††
Struthers,O. Y1	8.65	9.30†
Worcester,Mass.A7	8.95	9.50†

Based on zinc price of: *13.50. †5c. ‡10c. ††Less than 10c. †††10.50c. **Subject to zinc equalization extras.

FASTENERS

(Base discounts, full container quantity, per cent off list, f.o.b. mill)

BOLTS

Carriage, Machine Bolts

Full Size Body (cut thread)

½ in. and smaller:	
6 in. and shorter	49.0
Longer than 6 in.	39.0
⅝ in. thru 1 in.:	
6 in. and shorter	39.0
Longer than 6 in.	35.0
1⅛ in. and larger:	
All lengths	35.0

Undersized Body (rolled thread)

½ in. and smaller:	
6 in. and shorter	49.0

Carriage, Machine, Lag Bolts

Hot Galvanized:

½ in. and smaller:	
6 in. and shorter	29.0
Longer than 6 in.	15.0
⅝ in. and larger:	
All lengths	12.0

Lag Bolts (all diam.)

6 in. and shorter	49.0
Longer than 6 in.	39.0

Plow and Tap Bolts

½ in. and smaller by 6 in. and shorter	49.0
Larger than ½ in. or longer than 6 in.	39.0

Blank Bolts 39.0

Step, Elevator, Tire Bolts 49.0

Stove Bolts, Slotted:

⅛ to ¼ in. incl., 3 in. and shorter	55.0
⅝ to ½ in., inclusive	55.0

NUTS

Reg. & Heavy Square Nuts:

All sizes 55.5

Square Nuts, Reg. & Heavy, Hot Galvanized:

All sizes 41.0

Hex Nuts, Reg. & Heavy, Hot Pressed:

¾ in. and smaller	60.5
⅞ in. to 1 in., incl.	55.5
1⅛ in. to 1½ in., incl.	58.5
1⅝ in. and larger	53.5

Hex Nuts, Reg. & Heavy, Cold Punched:

¾ in. and smaller	60.5
⅞ in. to 1½ in., incl.	55.5
1⅝ in. and larger	53.5

Hex Nuts, All Types, Hot Galvanized:

¾ in. and smaller	46.5
⅞ in. to 1 in., incl.	41.5
1⅛ in. to 1½ in., incl.	46.5

Hex Nuts, Semifinished, Heavy (Incl. Slotted):

¾ in. and smaller	60.5
⅞ in. to 1½ in., incl.	55.5
1⅝ in. and larger	53.5

Hex Nuts, Finished (Incl. Slotted and Castellated):

1 in. and smaller	63.0
1⅛ in. to 1½ in., incl.	59.0
1⅝ in. and larger	53.5

Semifinished Hex Nuts, Reg. (Incl. Slotted):

⅝ in. and smaller	60.5
¾ in. to 1 in., incl.	63.0
1⅛ to 1½ in., incl.	59.0
1⅝ in. and larger	53.5

CAP AND SETSCREWS

(Base discounts, packages, per cent off list, f.o.b. mill)

Hex Head Capscrews, Coarse or Fine Thread, Bright:

6 in. and shorter:	
⅝ in. and smaller	40.0
¾, ⅞, and 1 in. diam.	22.0
Longer than 6 in.:	
⅝ in. and smaller	8.0
¾, ⅞, and 1 in. diam.	+ 6.0

High Carbon, Heat Treated:

6 in. and shorter:	
⅝ in. and smaller	26.0
¾, ⅞, and 1 in. diam.	3.0
Longer than 6 in.:	
⅝ in. and smaller	+ 13.0
¾, ⅞, and 1 in. diam.	+ 32.0

Flat Head Capscrews:

¾ in. and smaller	+ 76.0

Setscrews, Square Head, Cup Point, Coarse Thread:

Through 1 in. diam.:	
6 in. and shorter	Net
Longer than 6 in.	+ 23

RIVETS

F.o.b. Cleveland and/or freight equalized with Pittsburgh, f.o.b. Chicago and/or freight equalized with Birmingham except where equalization is too great.

Structural ½ in., larger 12.25

⅞ in. under: List less 19%

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
1	13	....	25.98	23.54
1¼	13	....	30.78	23.36
1½	13	29.03	34.01	25.83
1¾	13	34.29	40.18	30.51
2	13	38.44	45.05	34.20
2¼	13	43.29	50.75	38.52
2½	12	46.99	55.06	41.81
2¾	12	51.76	60.65	46.05
2¾	12	56.04	65.67	49.88
3	12	59.76	70.03	53.19

RAILWAY MATERIALS

	Standard No. 1	Standard No. 2	Tee Rails All No. 2	Tee Rails 60-lb Under
Rails				
Bessemer,Pa. U5	5.525	5.425	....	6.50
Ensley,Ala. T2	5.525	5.425	....	6.50
Fairfield,Ala. T2	....	....	....	6.50
Gary,Ind. U5	5.525	5.425	....	....
Huntington,W.Va. C15	....	....	....	6.50
IndianaHarbor,Ind. I-2	5.525	5.425	5.475	....
Johnstown,Pa. B2	....	....	....	(16)6.50
Lackawanna,N.Y. B2	5.525	5.425	....	6.50
Minnequa,Colo. C10	5.525	5.425	....	7.00
Steelton,Pa. B2	5.525	5.425	....	....
Williamsport,Pa. S19	....	....	....	6.50

TIE PLATES

Fairfield,Ala. T2	6.60
Gary,Ind. U5	6.60
Ind.Harbor,Ind. I-2	6.60
Lackawanna,N.Y. B2	6.60
Minnequa,Colo. C10	6.60
Seattle B3	6.75
Steelton,Pa. B2	6.60
Torrance,Calif. C11	6.75

JOINT BARS

Bessemer,Pa. U5	6.975
Fairfield,Ala. T2	6.975
Ind.Harbor,Ind. I-2	6.975
Joliet,Ill. U5	6.975
Lackawanna,N.Y. B2	6.975
Minnequa,Colo. C10	6.975
Steelton,Pa. B2	6.975

AXLES

Ind.Harbor,Ind. S13	8.775
Johnstown,Pa. B2	8.775

TRACK BOLTS, Untreated

Cleveland R2	14.75
KansasCity,Mo. S5	14.75
Lebanon,Pa. B2	14.75
Minnequa,Colo. C10	14.75
Pittsburgh P14	14.75
Seattle B3	15.25

SCREW SPIKES

Lebanon,Pa. B2	14.50

STANDARD TRACK SPIKES

Fairfield,Ala. T2	9.75
Ind.Harbor,Ind. I-2, Y1	9.75
KansasCity,Mo. S5	9.75
Lebanon,Pa. B2	9.75
Minnequa,Colo. C10	9.75
Pittsburgh J5	9.75
Seattle B3	10.25
S.Chicago,Ill. R2	9.75
Struthers,O. Y1	9.75
Youngstown R2	9.75

Footnotes

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1⅛ to under 1 7/16 in.; 1 7/16 to under 1 15/16 in., 6.70c; 1 15/16 to 8 in., inclusive, 7.05c.
(6) Chicago or Birm. Base.
(7) Chicago base 2 cols. lower.
(8) 16 Ga. and heavier.
(9) Merchant quality; add 0.35c for special quality.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass. base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 5.80c.
(15) ⅜" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(21) New Haven, Conn. base.
(22) Deld. San Francisco Bay area.
(23) Special quality.
(24) Deduct 0.15c, finer than 15 Ga.
(25) Bar mill bands.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; for universal mill add 0.45c.
(31) Widths over ⅝ in.; 7.60c, for widths ⅝ in. and under by 0.125 in. and thinner.
(32) Buffalo base.
(33) To jobbers, deduct 20c.
(34) 9.60c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) Chicago base, 10 points lower.
(38) 14 Ga. & lighter; 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.
(41) 9.10c for cut lengths.
(42) Mill lengths, f.o.b. mill; deld. in mill zone or within switching limits, 5.685c.
(43) 9-14½ Ga.
(44) To fabricators.
(48) 6.7 Ga.
(49) 3½ in. and smaller rounds; 9.50c, over 3½ in. and other shapes.

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	+9.25	+24.25	+2.75	+19.5	+0.25	+17	1.25	+15.5	1.25	+15.5	1	+15.75	3.5	+13.25
Ambridge, Pa. N2	+9.25	....	+2.75	....	+0.25	....	1.25	....	1.25	....	1	+15.75	3.5	+13.25
Lorain, O. N3	+9.25	+24.25	+2.75	+19.5	+0.25	+17	1.25	+15.5	1.25	+15.5	1	+15.75	3.5	+13.25
Youngstown Y1	+9.25	+24.25	+2.75	+19.5	+0.25	+17	1.25	+15.5	1.25	+15.5	1	+15.75	3.5	+13.25

ELECTRIC STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown R2	+9.25	+24.25	+2.75	+19.5	+0.25	+17	1.25	+15.5	1.25	+15.5	1	+15.75	3.5	+13.25

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	¼		¾		⅜		½		¾		1		1¼	
List Per Ft	5.5c		6c		6c		8.5c		11.5c		17c		23c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	....	....	....	....	....	....	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Alton, Ill. L1	....	....	....	....	....	....	3.25	+12	6.25	+8	9.75	+3.5	12.25	+2.75
Benwood, W. Va. W10	4.5	+22	+7.5	+31	+18	+39.5	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Butler, Pa. F6	5.5	+21	+6.5	+30	+17	+38.5	....	....	....	....	....	....	....	....
Etna, Pa. N2	....	....	....	....	....	....	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Fairless, Pa. N3	....	....	....	....	....	....	3.25	+12	6.25	+8	9.75	+3.5	12.25	+2.75
Fontana, Calif. K1	....	....	....	....	....	....	+8.25	+23.5	+5.25	+19.5	+1.75	+15	0.75	+14.25
Indiana Harbor, Ind. Y1	....	....	....	....	....	....	4.25	+11	7.25	+7	10.75	+2.5	13.25	+3.25
Lorain, O. N3	....	....	....	....	....	....	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Sharon, Pa. S4	5.5	+21	+6.5	+30	+17	+38.5	....	....	....	....	....	....	....	....
Sharon, Pa. M6	....	....	....	....	....	....	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Sparrows Pt., Md. B2	3.5	+23	+8.5	+32	+19	+40.5	3.25	+12	6.25	+8	9.75	+3.5	12.25	+2.75
Wheatland, Pa. W9	5.5	+21	+6	+30	+17	+38.5	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Youngstown R2, Y1	....	....	....	....	....	....	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75

Size—Inches	1½		2		2½		3		3½		4	
List Per Ft	27.5c		37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	2.73		3.68		5.82		7.62		9.20		10.89	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	....	....	....	....
Alton, Ill. L1	12.75	+1.75	13.25	+1.25	14.75	+1.5	14.75	+1.5	....	....	....	....
Benwood, W. Va. W10	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	6.25	+10.5	6.25	+10.5
Etna, Pa. N2	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	6.25	+10.5	6.25	+10.5
Fairless, Pa. N3	12.75	+1.75	13.25	+1.25	14.75	+1.5	14.75	+1.5	4.25	+12.5	4.25	+12.5
Fontana, Calif. K1	1.25	+13.25	1.75	+12.75	3.25	+13	3.25	+13	+7.25	+24	+7.25	+24
Indiana Harbor, Ind. Y1	13.75	+0.75	14.25	+0.25	15.75	+0.5	15.25	+0.5	5.25	+11.5	5.25	+11.5
Lorain, O. N3	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	....	....	....	....
Sharon, Pa. M6	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	....	....	....	....
Sparrows Pt., Md. B2	12.75	+1.75	13.25	+1.25	14.75	+1.5	14.75	+1.5	4.25	+12.5	4.25	+12.5
Wheatland, Pa. W9	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	6.25	+10.5	6.25	+10.5
Youngstown R2, Y1	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	6.25	+10.5	6.25	+10.5

*Galvanized pipe discounts based on current price of zinc (10.00c, East St. Louis).

Stainless Steel

Representative prices, cents per pound; subject to current lists of extras.

AISI Type	—Rerolling— Ingot	Slabs	Forging Billets	H.R. Strip	H.R. Rods; C.F. Wire	Bars; Structural Shapes	Plates	Sheets	C.R. Strip; Flat Wire
201	22.00	27.00	....	36.00	40.00	42.00	44.25	48.50	45.00
202	23.75	30.25	36.50	39.00	40.75	43.00	45.00	49.25	49.25
301	23.25	28.00	37.25	37.25	42.00	44.25	46.25	51.25	47.50
302	25.25	31.50	38.00	40.50	42.75	45.00	47.25	52.00	52.00
302B	25.50	32.75	40.75	45.75	45.00	47.25	49.50	57.00	57.00
303	....	32.00	41.00	46.00	45.50	48.00	50.00	56.75	56.75
304	27.00	33.25	40.50	44.25	45.25	47.75	50.75	55.00	55.00
304L	....	....	48.25	51.50	53.00	55.50	58.50	63.25	62.75
305	28.50	36.75	42.50	47.50	45.25	47.75	51.25	58.75	58.75
308	30.75	38.25	47.25	50.25	52.75	55.75	60.25	63.00	63.00
309	39.75	49.50	57.75	64.50	63.75	67.00	71.00	80.50	80.50
310	49.75	61.50	78.00	84.25	86.50	91.00	92.75	96.75	96.75
314	....	....	77.50	....	86.50	91.00	92.75	99.00	104.25
316	39.75	49.50	62.25	69.25	69.25	73.00	76.75	80.75	80.75
316L	....	55.50	70.00	76.50	77.00	80.75	84.50	89.25	88.50
317	48.00	60.00	76.75	88.25	86.25	90.75	93.50	101.00	101.00
321	32.25	40.00	47.00	53.50	52.50	55.50	59.75	65.50	65.50
330	....	....	106.75	....	95.25	106.75	105.50	108.00	149.25
18-8 CbTa	37.00	46.50	55.75	63.50	61.50	64.75	69.75	79.25	79.25
403	....	....	28.25	....	32.00	33.75	35.00	40.25	40.25
405	19.50	25.50	29.75	36.00	33.50	35.25	37.50	46.75	46.75
410	16.75	21.50	28.25	31.00	32.00	33.75	35.00	40.25	40.25
416	....	....	28.75	....	32.50	34.25	36.00	48.25	48.25
420	26.00	33.50	34.25	41.75	39.25	41.25	45.25	52.00	62.00
430	17.00	21.75	28.75	32.00	32.50	34.25	36.00	40.75	40.75
430F	....	....	29.50	....	33.00	34.75	36.75	51.75	42.00
431	....	28.75	37.75	....	42.00	44.25	46.00	56.00	56.00
446	....	....	39.25	59.00	44.25	46.50	47.75	70.00	70.00

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; American Steel & Wire Div., U. S. Steel Corp.; Anchor Drawn Steel Co., division of Vanadium-Alloys Steel Co.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; A. M. Byers Co.; G. O. Carlson Inc.; Carpenter Steel Co.; Carpenter Steel Co. of New England; Charter Wire Products; Crucible Steel Co. of America; Damascus Tube Co.; Dearborn Div., Sharon Steel Corp.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Firth Sterling Inc.; Fort Wayne Metals Inc.; Green River Steel Corp., subsidiary of Jessop Steel Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg-Warner Corp.; Ellwood Ivins Steel Tube Works Inc.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Stainless Steel Div., Jones & Laughlin Steel Corp.; Joslyn Stainless Steels, division of Joslyn Mfg. & Supply Co.; Latrobe Steel Co.; Lukens Steel Co.; Maryland Fine & Specialty Wire Co. Inc.; McLouth Steel Corp.; Metal Forming Corp.; Midvale-Heppenstall Co.; National Standard Co.; National Tube Div., U. S. Steel Corp.; Pacific Tube Co.; Page Steel & Wire Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Riverside-Alloy Metal Div., H. K. Porter Company Inc.; Rodney Metals Inc.; Sawhill Tubular Products Inc.; Sharon Steel Corp.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Standard Tube Co.; Superior Steel Div., Copperweld Steel Co.; Superior Tube Co.; Swepco Tube Corp.; Techalloy Co. Inc.; Timken Roller Bearing Co.; Trent Tube Co., subsidiary of Crucible Steel Co. of America; Tube Methods Inc.; Ulbrich Stainless Steels Inc.; U. S. Steel Corp.; Universal-Cyclops Steel Corp.; Vanadium-Alloys Steel Co.; Wall Tube & Metal Products Co.; Wallingford Steel Co., subsidiary of Allegheny Ludlum Steel Corp.; Washington Steel Corp.

Clad Steel

	Plates—Carbon Base 5%	10%	15%	20%	Sheets—Carbon Base 20%
Stainless					
302	....	....	....	....	37.50
304	34.70	37.95	42.25	46.70	39.75
304L	36.90	40.55	45.10	49.85	....
316	40.35	44.50	49.50	54.50	58.25
316L	45.05	49.35	54.70	60.10	....
316 Cb	47.30	53.80	61.45	69.10	....
321	36.60	40.05	44.60	49.30	47.25
347	38.25	42.40	47.55	52.80	57.00
405	28.60	29.85	33.35	36.85	....
410	28.15	29.55	33.10	36.70	....
430	28.30	29.80	33.55	37.25	....
Inconel	48.00	59.55	70.15	80.85	....
Nickel	41.65	51.95	62.30	72.70	....
Nickel, Low Carbon	41.95	52.60	63.30	74.15	....
Monel	43.35	53.55	63.80	74.05	....
Copper*	....	....	....	....	46.00

	Strip, Carbon Base —Cold Rolled— 10%	Both Sides
Copper*	33.10	38.75

*Deoxidized. Production points: Stainless-clad sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4, and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; copper-clad strip, Carnegie, Pa. S18.

Tool Steel

Grade	$ per lb	Grade	$ per lb
Regular Carbon	0.305	Cr-Hot Work	0.475
Extra Carbon	0.360	W-Cr Hot Work	0.500
Special Carbon	0.475	V-Cr Hot Work	0.520
Oil Hardening	0.475	Hi-Carbon-Cr	0.925

Grade by Analysis (%) W	Cr	V	Co	Mo	$ per lb
20 25	4.25	1.6	12.25	....	4.285
18 25	4.25	1	4.75	....	2.500
18	4	2	9	....	2.870
18	4	2	....	....	1.960
18	4	1	....	....	1.795
9	3.5	..	....	....	1.395
13.5	4	3	....	....	2.060
13.75	3.75	2	5	....	2.440
6.4	4.5	1.9	....	5	1.300
6	4	3	....	6	1.545
1.5	4	1	....	8.5	1.155

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, F2, J3, L3, M14, S8, U4, V2, and V3.

Pig Iron

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate.

	Basic	No. 2 Foundry	Malle-able	Besse-mer
Birmingham District				
Birmingham R2	62.00	62.50‡	....	....
Birmingham U6	....	62.50‡	66.50	....
Woodward,Ala. W15	62.00**	62.50‡	66.50	....
Cincinnati, deld.	....	70.20	....	....
Buffalo District				
Buffalo H1, R2	66.00	66.50	67.00	67.50
N.Tonawanda,N.Y. T9	....	66.50	67.00	67.50
Tonawanda,N.Y. W12	66.00	66.50	67.00	67.50
Boston, deld.	77.29	77.79	78.29	....
Rochester,N.Y., deld.	69.02	69.52	70.02	....
Syracuse,N.Y., deld.	70.12	70.62	71.12	....
Chicago District				
Chicago I-3	66.00	66.50	66.50	67.00
S.Chicago,Ill. R2	66.00	66.50	66.50	67.00
S.Chicago,Ill. W14	66.00	....	66.50	67.00
Milwaukee, deld.	69.02	69.52	69.52	70.02
Muskegon,Mich., deld.	....	74.52	74.52	....
Cleveland District				
Cleveland R2, A7	66.00	66.50	66.50	67.00
Akron,Ohio, deld.	69.52	70.02	70.02	70.52
Mid-Atlantic District				
Birdsboro,Pa. B10	68.00	68.50	69.00	69.50
Chester,Pa. P4	68.00	68.50	69.00	....
Swedeland,Pa. A3	68.00	68.50	69.00	69.50
NewYork, deld.	....	75.50	76.00	....
Newark,N.J., deld.	72.69	73.19	73.69	74.19
Philadelphia, deld.	70.41	70.91	71.41	71.99
Troy,N.Y. R2	68.00	68.50	69.00	69.50
Pittsburgh District				
NevilleIsland,Pa. P6	66.00	66.50	66.50	67.00
Pittsburgh (N&S sides), Aliquippa, deld.	....	67.95	67.95	68.48
McKeesRocks,Pa., deld.	....	67.60	67.60	68.13
Lawrenceville,Homestead, Wilmerding,Monaca,Pa., deld.	....	68.26	68.26	68.79
Verona,Trafford,Pa., deld.	68.29	68.82	68.82	69.35
Brackenridge,Pa., deld.	68.60	69.10	69.10	69.63
Midland,Pa. C18	66.00	....	....	....
Youngstown District				
Hubbard,Ohio Y1	....	....	66.50	....
Sharpsville,Pa. S6	66.00	....	66.50	67.00
Youngstown Y1	....	....	66.50	67.00
Mansfield,Ohio, deld.	71.30	....	71.80	72.30
Duluth I-3	66.00	66.50	66.50	67.00
Erie,Pa. I-3	66.00	66.50	66.50	67.00
Everett,Mass. E1	67.50	68.00	68.50	....
Fontana,Calif. K1	75.00	75.50	....	....
Geneva,Utah C11	66.00	66.50	....	....
GraniteCity,Ill. G4	67.90	68.40	68.90	....
Ironton,Utah C11	66.00	66.50	....	....
Minnequa,Colo. C10	68.00	68.50	69.00	....
Rockwood,Tenn. T3	....	62.50‡	66.50	....
Toledo,Ohio I-3	66.00	66.50	66.50	67.00
Cincinnati, deld.	72.94	73.44	....	....

**Phos. 0.70-0.90%; Phos. 0.30-0.69%, $63.
‡Phos. 0.70-0.90%; Phos. 0.30-0.69%, $63.50.

PIG IRON DIFFERENTIALS

Silicon: Add 75 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos. iron on which base is 1.75-2.00%.

Manganese: Add 50 cents per ton for each 0.25% manganese over 1% or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, inclusive, add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.00-6.50% silicon; add $1 for each 0.50% silicon or portion thereof over the base grade within a range of 6.50 to 11.50%; starting with silicon over 11.50% and $1.50 per ton for each 0.50% silicon or portion thereof up to 14%; add $1 for each 0.50% Mn over 1%)

Jackson,Ohio I-3, J1	$78.00
Buffalo H1	79.25

ELECTRIC FURNACE SILVERY IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1.25 for each 0.50% Mn over 1%; $2 per gross ton premium for 0.045% max P)

CalvertCity,Ky. P15	$99.00
NiagaraFalls, N.Y. P15	99.00
Keokuk,Iowa Open-hearth & Fdry. $9 freight allowed K2	103.50
Keokuk,Iowa O.H. & Fdry. 12½ lb piglets, 16% Si, max fr'gt allowed up to $9, K2	106.50

LOW PHOSPHORUS PIG IRON, Gross Ton

Lyles,Tenn. T3 (Phos. 0.035% max)	$78.50
Rockwood,Tenn. T3 (Phos. 0.035% max)	78.50
Troy,N.Y. R2 (Phos. 0.035% max)	74.00
Philadelphia, deld.	82.67
Cleveland A7 (Intermediate) (Phos. 0.036-0.075% max)	71.00
Duluth I-3 (Intermediate) (Phos. 0.036-0.075% max)	71.00
Erie,Pa. I-3 (Intermediate) (Phos. 0.036-0.075% max)	71.00
NevilleIsland,Pa. P6 (Intermediate) (Phos. 0.036-0.075% max)	71.00

Steel Service Center Products

Representative prices, per pound, subject to extras, f.o.b. warehouse. City delivery charges are 15 cents per 100 lb except: Denver, Moline, Norfolk, Richmond, Washington, 20 cents; Baltimore, Boston, Los Angeles, New York, Philadelphia, Portland, Spokane, San Francisco, 10 cents; Atlanta, Birmingham, Chattanooga, Houston, Seattle, no charge.

	SHEETS				STRIP	BARS			Standard Structural Shapes	PLATES	
	Hot-Rolled	Cold-Rolled	Gal. 10 Ga.†	Stainless Type 302	Hot-Rolled*	H.R. Rounds	C.F. Rds.‡	H.R. Alloy 4140††[5]		Carbon	Floor
Atlanta	8.59§	9.86§	....	....	8.64	9.01	10.68	....	9.05	8.97	10.90
Baltimore	8.00	8.90	9.68	....	8.70	8.65	12.33#	15.18	8.50	8.65	9.75
Birmingham	8.18	9.45	10.46	....	8.23	8.60	10.57	....	8.64	8.56	10.70
Boston	9.38	10.44	11.45	53.50	9.42	9.73	12.90#	15.28	9.63	9.72	11.20
Buffalo	8.25	9.00	11.07	55.98	8.50	8.80	11.00#	15.00	8.90	8.90	10.45
Chattanooga	8.35	9.69	9.65	....	8.40	8.77	10.46	....	8.88	8.80	10.66
Chicago	8.20	9.45	10.10	53.00	8.23	8.60	8.80	14.65	8.64	8.56	9.88
Cincinnati	8.34	9.48	10.10	52.43	8.54	8.92	11.06	14.86	9.18	8.93	10.21
Cleveland	8.18	9.45	10.20	52.33	8.33	8.69	10.80#	14.74	9.01	8.79	10.11
Dallas	7.50	8.80	....	....	7.65	7.60	11.01	....	7.65	8.10	9.35
Denver	9.40	11.84	12.94	....	9.43	9.80	11.19	....	9.84	9.76	11.08
Detroit	8.43	9.70	10.45	56.50	8.58	8.90	9.15	14.91	9.18	8.91	10.13
Erie, Pa.	8.20	9.45	9.95[10]	....	8.50	8.75	9.05[10]	....	9.00	8.85	10.10
Houston	7.10	8.40	8.45	54.32	7.25	7.20	11.10	13.50	7.25	7.70	8.95
Jackson, Miss.	8.52	9.79	....	....	8.57	8.94	10.68	....	8.97	8.90	10.74
Los Angeles	8.25[2]	10.30[2]	11.90[2]	57.60	8.90	8.70[2]	12.10[2]	16.10	8.50[2]	8.65[2]	10.80[2]
Memphis, Tenn.	8.55	9.80	....	....	8.60	8.97	11.96#	....	9.01	8.93	10.56
Milwaukee	8.33	9.58	10.23	....	8.36	8.73	9.03	14.78	8.85	8.69	10.01
Moline, Ill.	8.55	9.80	10.45	....	8.58	8.95	9.15	....	8.99	8.91	....
New York	8.87	10.13	10.56	53.08	9.31	9.57	12.76#	15.09	9.35	9.43	10.66
Norfolk, Va.	8.40	....	....	....	9.10	9.10	12.00	....	9.40	8.85	10.35
Philadelphia	8.00	8.90	9.92	52.69	8.70	8.65	11.51#	15.01	8.50	8.75	9.75**
Pittsburgh	8.18	9.45	10.45	52.00	8.33	8.60	10.80#	14.65	8.64	8.56	9.88
Portland, Oreg.	8.50	11.20	11.55	57.38	9.55	8.65	14.50	15.95	8.65	8.30	11.50
Richmond, Va.	8.40	....	10.40	....	9.10	9.00	....	....	9.40	8.85	10.35
St. Louis	8.54	9.79	10.36	....	8.59	8.97	9.41	15.01	9.10	8.93	10.25
St. Paul	8.79	10.04	10.71	....	8.84	9.21	9.66	....	9.38	9.30	10.49
San Francisco	9.35	10.75	11.00	55.10	9.45‡‡	9.70	13.00	16.00	9.50	9.60	12.00
Seattle	9.05	11.15	12.20	57.38	10.00	10.10	14.05	16.35	9.80	9.70	12.10
South'ton, Conn	9.07	10.33	10.71	....	9.48	9.74	....	....	9.57	9.57	10.91
Spokane	9.95	11.15	12.20	57.38	10.00	10.10	14.05	16.35	9.80	9.70	12.10
Washington	8.88	....	....	....	9.36	9.56	10.94	....	9.79	9.26	10.74

*Prices do not include gage extras; †prices include gage and coating extras; ‡includes 35-cent bar quality extras; §42 in. and under; **¼ in. and heavier; ††as annealed; ‡‡¾ in. to 4 in. wide, inclusive; #1 in. round C-1018.

Base quantities, 2000 to 4999 lb except as noted; cold-rolled strip and cold-finished bars, 2000 lb and over except in Seattle, 2000 to 9999 lb; stainless sheets, 8000 lb except in Chicago, New York, Boston, Seattle, Portland, Oreg. 10,000 lb and in San Francisco, 2000 to 4999 lb; hot-rolled products on West Coast, 2000 to 9999 lb, except in Portland, Oreg., 1000 to 9999 lb; [2]—30,000 lb; [5]—1000 to 1999 lb; [10]—2000 lb and over.

Refractories

Fire Clay Brick (per 1000)

High-Heat Duty: Ashland, Grahn, Hayward, Hitchins, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Winburne, Snow Shoe, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parrail, Portsmouth, Ohio, Ottawa, Ill., Stevens Pottery, Ga., $135; Salina, Pa., $140; Niles, Ohio, $138; Cutler, Utah, $165.

Super-Duty: Ironton, Ohio, Vandalia, Mo., Olive Hill, Ky., Clearfield, Salina, Winburne, Snow Shoe, Pa., New Savage, Md., St. Louis, $175; Stevens Pottery, Ga., $185; Cutler, Utah, $233.

Silica Brick (per 1000)

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Pt. Matilda, Pa., Portsmouth, Ohio, Hawstone, Pa., $150; Warren, Niles, Windham, Ohio, Hays, Latrobe, Morrisville, Pa., $155; E. Chicago, Ind., Joliet, Rockdale, Ill., $160; Lehigh, Utah, $175; Los Angeles, $180.

Super-Duty: Sproul, Hawstone, Pa., Niles, Warren, Windham, Ohio, Leslie, Md., Athens, Tex., $157; Morrisville, Hays, Latrobe, Pa., $160; E. Chicago, Ind., $167; Curtner, Calif., $182.

Semisilica Brick (per 1000)

Clearfield, Pa., $140; Philadelphia, $137; Woodbridge, N. J., $135.

Ladle Brick (per 1000)

Dry Pressed: Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Vanport, Pa., Mexico, Vandalia, Mo., Wellsville, Irondale, New Salisbury, Ohio, $96.75; Clearfield, Pa., Portsmouth, Ohio, $102.

High-Alumina Brick (per 1000)

50 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $235; Danville, Ill., $238; Philadelphia, Clearfield, Pa., $230; Orviston, Snow Shoe, Pa., $245.

60 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $295; Danville, Ill., $298; Clearfield, Orviston, Snow Shoe, Pa., $305; Philadelphia, $310.

70 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $335; Danville, Ill., $338; Clearfield, Orviston, Snow Shoe, Pa., $345; Philadelphia, $350.

Sleeves (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., St. Louis, $188.

Nozzles (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., St. Louis, $310.

Runners (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., $234.

Dolomite (per net ton)

Domestic, dead-burned, bulk, Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Woodville, Gibsonburg, Narlo, Ohio, $16.75; Thornton, McCook, Ill., $17; Dolly Siding, Bonne Terre, Mo., $15.60.

Magnesite (per net ton)

Domestic, dead-burned, ½ in. grains with fines: Chewelah, Wash., Luning, Nev., $46; ⅜ in. grains with fines: Baltimore, $73.

Fluorspar

Metallurgical grades, f.o.b. shipping point in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $37-$41; 70%, $36-$40; 60%, $33-$36.50. Imported, net tons, f.o.b. cars point of entry, duty paid, metallurgical grade: European, $30-$33, contract; Mexican, all rail, duty paid, $25; barge, Brownsville, Tex., $27.

Ores

Lake Superior Iron Ore

(Prices effective for the 1958 shipping season, gross ton, 51.50% iron natural, rail of vessel, lower lake ports.)

Mesabi bessemer	$11.60
Mesabi nonbessemer	11.45
Old Range bessemer	11.55
Old Range nonbessemer	11.70
Open-hearth lump	12.70
High phos	11.45

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon, which were in effect Jan. 30 1957, and increases or decreases after that date are absorbed by the seller.

Eastern Local Iron Ore

Cents per unit, deld. E. Pa.

New Jersey, foundry and basic 62-64% concentrates	18.00-19.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 65%	25.00
N. African hematite (spot)	nom.
Brazilian iron ore, 68.5%	14.60

Tungsten Ore

Net ton, unit

Foreign wolframite, good commercial quality	$9.50-10.00
Domestic, concentrates f.o.b. milling points	17.00-22.00

*Before duty.

Manganese Ore

Mn 46-48%, Indian (export tax included), $1.15 per long ton unit, c.i.f. U. S. ports, duty for buyer's account; other than Indian, nominal; contracts by negotiation.

Chrome Ore

Gross ton, f.o.b. cars New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., Tacoma, Wash.

Indian and Rhodesian

48% 3:1	$46.00-48.00
48% 2.8:1	42.00-44.00
48% no ratio	32.00-34.00

South African Transvaal

48% no ratio	$32.00-34.00
44% no ratio	24.00-25.00

Turkish

48% 3:1	$51.00-55.00

Domestic

Rail nearest seller

18% 3:1	$39.00

Molybdenum

Sulfide concentrate, per lb of Mo content, mines, unpacked	$1.23

Antimony Ore

Per short ton unit of Sb content, c.i.f. seaboard

50-55%	$2.25-2.40
60-65%	2.50-3.10

Vanadium Ore

Cents per lb V_2O_5

Domestic	31.00

Metal Powder

(Per pound f.o.b. shipping point in ton lots for minus 100 mesh, except as noted)

	Cents
Sponge Iron, Swedish: deld. east of Mississippi River, ocean bags 23,000 lb and over.. f.o.b. Riverton or Camden, N. J., west of Mississippi River.	10.50 9.50
Sponge Iron, Dometic, 98 + % Fe: Deld. east of Mississippi River, 23,000 lb and over	10.50
Electrolytic Iron: Melting stock, 99.9% Fe, irregular fragments of ⅛ in. x 1.3 in.	28.00
Annealed, 99.5% Fe..	36.50
Unannealed (99 + % Fe)	36.00
Unannealed (99 + % Fe) (minus 325 mesh)	59.00
Powder Flakes (minus 16, plus 100 mesh).	29.00
Carbonyl Iron: 98.1-99.9%, 3 to 20 microns, depending on grade, 93.00-290.00 in standard 200-lb containers; all minus 200 mesh.	
Aluminum: Atomized, 500-lb drum, freight allowed: Carlots	39.50
Ton lots	41.50
Antimony, 500-lb lots	42.00*
Brass, 5000-lb lots	31.00-46.70†
Bronze, 5000-lb lots	47.20-51.50†
Copper: Electrolytic	14.75*
Reduced	14.75*
Lead	7.50*
Manganese: Minus 35 mesh	64.00
Minus 100 mesh	70.00
Minus 200 mesh	75.00
Nickel, unannealed	74.00
Nickel-Silver, 5000-lb lots	48.80-53.50†
Phosphor-Copper, 5000-lb lots	59.30
Copper (atomized) 5000-lb lots	39.80-48.30†
Silicon	47.50
Solder	7.00*
Stainless Steel, 304	$1.07
Stainless Steel, 316	$1.26
Tin	14.50*
Zinc, 5000-lb lots	17.50-30.70‡
Tungsten: Melting grade, 99% 60 to 200 mesh, nominal: 1000 lb and over	Dollars 3.15
Less than 1000 lb	3.30
Chromium, electrolytic 99.8% Cr min metallic basis	5.00

*Plus cost of metal. †Depending on composition. ‡Depending on mesh.

Electrodes

Threaded with nipple; unboxed, f.o.b. plant

GRAPHITE

Inches Diam	Inches Length	Per 100 lb
2	24	$60.75
2½	30	39.25
3	40	37.00
4	40	35.00
5⅛	40	34.75
6	60	31.50
7	60	28.25
8, 9, 10	60	28.00
12	72	26.75
14	60	26.75
16	72	25.75
17	60	26.25
18	72	26.25
20	72	25.25
24	84	26.00

CARBON

8	60	13.30
10	60	13.00
12	60	12.95
14	60	12.85
14	72	11.95
17	60	11.85
17	72	11.40
20	84	11.40
20	90	11.00
24	72, 84	11.25
24	96	10.95
30	84	11.05
40, 35	110	10.70
40	100	10.70

Metallurgical Coke

Price per net ton

Beehive Ovens

Connellsville, Pa. furnace	$14.75-15.75
Connellsville, Pa., foundry	18.00-18.50

Oven Foundry Coke

Birmingham, ovens	$28.85
Cincinnati, deld.	31.84
Buffalo, ovens	30.50
Camden, N. J., ovens	29.50
Detroit, ovens	30.50
Pontiac, Mich., deld.	32.45
Saginaw, Mich., deld.	34.03
Erie, Pa., ovens	30.50
Everett, Mass., ovens: New England, deld.	31.55*
Indianapolis, ovens	29.75
Ironton, Ohio, ovens	29.00
Cincinnati, deld.	31.84
Kearny, N. J., ovens	29.75
Milwaukee, ovens	30.50
Neville Island (Pittsburgh), Pa., ovens	29.25
Painesville, Ohio, ovens	30.50
Cleveland, deld.	32.69
Philadelphia, ovens	29.50
St. Louis, ovens	31.50
St. Paul, ovens	29.75
Chicago, deld.	33.29
Swedeland, Pa., ovens	29.50
Terre Haute, Ind., ovens	29.75

*Or within $4.85 freight zone from works.

Imported Steel

(Base per 100 lb, landed, duty paid, based on current ocean rates. Any increase in these rates is for buyer's account. Source of shipment: Western continental European countries.)

	North Atlantic	South Atlantic	Gulf Coast	West Coast
Deformed Bars, Intermediate, ASTM-A 305..	$5.30	$5.30	$5.30	$5.50
Bar Size Angles	5.05	5.05	5.05	5.42
Structural Angles	5.05	5.05	5.05	5.42
I-Beams	5.11	5.11	5.11	5.45
Channels	5.11	5.11	5.11	5.45
Plates (basic bessemer)	6.62	6.62	6.62	6.94
Sheets, H.R.	8.20	8.20	8.20	8.50
Sheets, C.R. (drawing quality)	8.75	8.75	8.75	9.12
Furring Channels, C.R., 1000 ft, ⅞ x 0.30 lb per ft	25.71	25.59	25.59	26.46
Barbed Wire (†)	6.65	6.65	6.65	7.00
Merchant Bars	6.07	6.07	6.07	6.43
Hot-Rolled Bands	7.15	7.15	7.15	7.55
Wire Rods, Thomas Commercial No. 5	*6.50*	*6.50*	*6.50*	*6.90*
Wire Rods, O.H. Cold Heading Quality No. 5	7.07	7.07	7.07	7.47
Bright Common Wire Nails (‡)	8.02	8.02	7.92	8.20

†Per 82 lb net reel. ‡Per 100-lb kegs, 20d nails and heavier.

Coal Chemicals

Spot, cents per gallon, ovens

Pure benzene	36.00
Toluene, one deg	29.50
Industrial xylene	32.00-34.00

Per ton, bulk, ovens

Ammonium sulfate	$32.00-34.00

Cents per pound, producing point

Phenol: Grade 1, 17.50; Grade 2-3, 15.50; Grade 4, 17.50; Grade 5, 16.50; Grade 6, 14.50.

Ferroalloys

MANGANESE ALLOYS

Spiegeleisen: Carlot, per gross ton, Palmerton, Neville Island, Pa., 21-23% Mn, $105; 19-21% Mn, 1-3% Si, $102.50; 16-19% Mn, $100.50.

Standard Ferromanganese: (Mn 74-76%, C 7% approx) base price per net ton, $245, Johnstown, Duquesne, Sheridan, Neville Island, Pa.; Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. Add or subtract $2 for each 1% or fraction thereof of contained manganese over 76% or under 74%, respectively. (Mn 79-81%), Lump $253 per net ton, f.o.b. Anaconda or Great Falls, Mont. Add $2.60 for each 1% above 81%; subtract $2.60 for each 1% below 79%, fractions in proportion to nearest 0.1%.

High-Grade Low-Carbon Ferromanganese: (Mn 85-90%). Carload, lump, bulk, max 0.07% C, 35.1c per lb of contained Mn, carload packed 36.4c, ton lots 37.9c, less ton 39.1c. Delivered. Deduct 1.5c for max 0.15% C grade from above prices, 3c for max 0.03% C, 3.5c for max 0.5% C, and 6.5c for max 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P 0.06% max). Add 2.05c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.25-1.5%, Si 1.5% max). Carload, lump, bulk, 25.5c per lb of contained Mn, packed carload 26.8c, ton lot 28.4c, less ton 29.6c Delivered. Spot, add 0.25c.

Manganese Metal: 2" x D (Mn 95.5% min, Fe 2% max, Si 1% max, C 0.2%). Carload, lump, bulk, 45c per lb of metal; packed, 45.75c; ton lot 47.25c; less ton lot 49.25c. Delivered. Spot, add 2c.

Electrolytic Manganese Metal: Min carload, 34c; 2000 lb to min carload, 36c; less ton, 38c; 50 lb cans, add 0.5c per lb. Premium for hydrogen-removed metal, 0.75c per lb. Prices are f.o.b. cars, Knoxville, Tenn., freight allowed to St. Louis or any point east of Mississippi; or f.o.b. Marietta, O., freight allowed.

Silicomanganese: (Mn 65-68%). Carload, lump, bulk 1.50% C grade, 18-20% Si, 12.8c per lb of alloy. Packed, c.l. 14c, ton 14.45c, less ton 15.45c, f.o.b. Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. For 2% C grade, Si 15-17%, deduct 0.2% from above prices. For 3% C grade, Si 12-14.5%, deduct 0.4c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lot, 2" x D, $1.50 per lb of contained Ti; less ton $1.55. (Ti 38-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lot $1.35, less ton $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract c.l. $240 per ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi River and north of Baltimore and St. Louis. Spot, $245.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4%). Contract c.l. $290 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed. Spot, $295.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l. lump, bulk 28.75c per lb of contained Cr; c.l. packed 30.30c, ton lot 32.05c; less ton 33.45c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: Cr 63-66% (Simplex), carload, lump, bulk, C 0.025% max, 36.75c per lb contained Cr; 0.010% max, 37.75c. Ton lot, add 3.5c; less ton, add 5.2c. Delivered.

Cr 67-71%, carload, lump, bulk, C 0.02% max, 41.00c per lb contained Cr; 0.025% max, 39.75c; 0.05% max, 39.00c; 0.10% max, 38.50c; 0.20% max, 38.25c; 0.50% max, 38.00c; 1.0% max, 37.75c; 1.5% max, 37.50c; 2.0% max, 37.25c. Ton lot, add 3.4c; less ton lot, add 5.1c. Delivered.

Foundry Ferrochrome, High-Carbon: (Cr 61-66%, C 5-7%, Si 7-10%). Contract, c.l., 2 in. x D, bulk 30.05c per lb of contained Cr. Packed, c.l. 31.65c, ton 33.45c, less ton 34.95c. Delivered. Spot, add 0.25c.

Foundry Ferrosilicon Chrome: (Cr 50-54%, Si 28-32%, C 1.25% max). Contract, carload packed, SM x D, 21.25c per lb of alloy, ton lot 22.50c; less ton lot 23.70c. Delivered. Spot, add 0.25c.

Ferrochrome-Silicon: Cr 39-41%, Si 42-45%, C 0.05% max or Cr 33-36%, Si 45-48%, C 0.05% max. Carload, lump, bulk, 3" x down and 2" x down, 27.50c per lb contained Cr, 14.20c per lb contained Si. 0.75" x down, 28.65c per lb contained Cr, 14.20c per lb contained Si. Delivered.

Chromium Metal, Electrolytic: Commercial grade (Cr 99.8% min, metallic basis, Fe 0.2% max). Contract, carlot, packed 2" x D plate (about ¼" thick) $1.29 per lb, ton lot $1.31, less ton lot $1.33. Delivered. Spot, add 5c.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth grade (V 50-55%, Si 5% max, C 3% max). Contract, any quantity, $3.20 per lb of contained V. Delivered. Spot, add 10c. **Special Grade:** (V 50-55% or 70-75%, Si 2% max, C 0.5% max) $3.30. **High Speed Grade:** (V 50-55% or 70-75%, Si 1.50% max, C 0.20% max) $3.40.

Grainal: Vanadium Grainal No. 1 $1.05 per lb; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract less carload lot, packed, $1.38 per lb contained V_2O_5, freight allowed. Spot, add 5c.

SILICON ALLOYS

50% Ferrosilicon: Contract, carload, lump, bulk, 14.20c per lb of contained Si. Packed c.l. 16.70c, ton lot 18.15c, less ton 19.80c, f.o.b. Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max). Add 1.45c to 50% ferrosilicon prices.

65% Ferrosilicon: Contract, carload, lump, bulk, 15.25c per lb contained silicon. Packed, c.l. 17.25c, ton lot 19.05c, less ton 20.4c. Delivered. Spot, add 0.35c.

75% Ferrosilicon: Contract, carload, lump, bulk, 16.4c per lb of contained Si. Packed, c.l. 18.30c, ton lot 19.95c, less ton 21.2c. Delivered. Spot, add 0.3c.

90% Ferrosilicon: Contract, carload, lump, bulk, 19.5c per lb of contained Si. Packed, c.l. 21.16c, ton lot 22.55c, less ton 23.6c. Delivered. Spot, add 0.25c.

Silicon Metal: (98% min Si, 1.00% max Fe, 0.07% max Ca). C.l. lump, bulk, 21.00c per lb of Si. Packed, c.l. 22.65c, ton lot 23.95c, less ton 24.95c. Add 0.5c for max 0.03% Ca grade. Add 0.5c for 0.50% Fe grade analyzing min 98.25% min Si.

Alsifer: (Approx 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 9.60c per lb of alloy; ton lot, packed, 10.95c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 39-43%, C 0.20% max). Contract, c.l. lump, bulk, 9.25c per lb of alloy. Packed, c.l. 10.45c, ton lot 11.6c, less ton 12.45c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max). Contract, carload, lump, packed 27.25c per lb of alloy, ton lot 28.4c, less ton 29.65c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more 1" x D, $1.20 per lb of alloy; less than 100 lb $1.30. Delivered. Spot, add 5c. F.o.b. Washington, Pa., prices, 100 lb and over are as follows: Grade A (10-14% B) 85c per lb; Grade B (14-18% B) $1.20; Grade C (19% min B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si). Carload, bulk, lump, or 3" x D, $5.25 per lb of contained B. Packed, carload $5.40, ton to c.l. $5.50, less ton $5.60. Delivered.

Carbortam: (B 1 to 2%). Contract, lump, carload $320 per ton, f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 23c per lb of alloy, carload packed 24.25c, ton lot 26.15c, less ton 27.15c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%; Si 60-65%, Fe 1.5-3%). Contract, carload, lump, bulk 24c per lb of alloy, carload packed 25.65c, ton lot 27.95c, less ton 29.45c. Delivered. Spot, add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx 3¾ lb each and containing 2 lb of Cr). Contract, carload, bulk 19.60c per lb of briquet, carload packed in box pallets 19.80c, in bags 20.70c; 3000 lb to c.l. in box pallets 21.00c; 2000 lb to c.l. in bags 21.90c; less than 2000 lb in bags 22.80c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx 3 lb and containing 2 lb of Mn). Contract, carload, bulk 14.8c per lb of briquet; c.l. packed, pallets 15c, bags 16c; 3000 lb to c.l. pallets 16.2c; 2000 lb to c.l., bags, 17.2c; less ton 18.1c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx 3½ lb and containing 2 lb of Mn and approx ½ lb of Si). Contract, c.l. bulk 15.1c per lb of briquet; c.l. packed, pallets, 15.3c; bags 16.3c, 3000 lb to c.l., pallets, 16.5c; 2000 lb to c.l., bags 17.5c; less ton 18.4c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx 5 lb and containing 2 lb of Si). Contract, carload, bulk 7.7c per lb of briquet; packed, pallets, 7.9c; bags 8.9c; 3000 lb to c.l., pallets 9.5c; 2000 lb to c.l., bags 10.5c; less ton 11.4c. Delivered. Spot, add 0.25c. (Small size—weighing approx 2½ lb and containing 1 lb of Si). Carload, bulk 7.85c. Packed, pallets 8.65c; bags 9.65c; 3000 lb to c.l. pallets 9.65c; 2000 lb to c.l., bags, 10.65c; less ton 11.55c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each). $1.41 per pound of Mo contained, f.o.b. Langeloth, Pa.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%), 5000 lb W or more $2.15 per lb (nominal) of contained W. Delivered.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 50-60%, Si 8% max, C 0.4% max). Ton lots 2" x D, $4 per lb of contained Cb; less ton lots, $4.05 (nominal). Delivered.

Ferrotantalum Columbium: (Cb 40% approx, Ta 20% approx, and Cb plus Ta 60% min, C 0.30% max). Ton lot 2" x D, $3.80 per lb of contained Cb plus Ta, delivered; less ton lot $3.85 (nominal).

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx). Contract, c.l. packed ½-in. x 12 M 20.00c per lb of alloy, ton lot 21.15c, less ton 22.40c. Delivered. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 20c per lb of alloy, ton lot 21.15c; less ton lot 22.4c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed 18.45c per lb of alloy; ton lot 19.95c; less ton lot 21.20c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

Siminal: (Approx 20% each Si, Mn, Al; bal Fe). Lump, carload, bulk 18.50c. Packed c.l. 19.50c, 2000 lb to c.l. 20.50c; less than 2000 lb 21c per lb of alloy. Delivered.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $5 for each 1% of P above or below the base); carload, bulk, f.o.b. sellers' works, Mt. Pleasant, Siglo, Tenn., $120 per gross ton.

Ferromolybdenum: (55-75%). Per lb of contained Mo, in 200-lb container, f.o.b. Langeloth and Washington, Pa. $1.68 in all sizes except powdered which is $1.74.

Technical Molybdic-Oxide: Per lb of contained Mo, in cans, $1.39; in bags, $1.38, f.o.b. Langeloth and Washington, Pa.

Only 70¢ worth of material protects all these rims

Zinc plated truck wheel rims are chromate treated with a Unichrome Dip Compound at CLEVELAND WELDING DIVISION, AMERICAN MACHINE & FOUNDRY COMPANY. A mere 70¢ worth of this material in solution was sufficient to treat all the rims visible in the picture above for extra corrosion resistance and a better base for paint.

Metal & Thermit offers one of the widest lines of chromating materials now available. Send for handy "Pick-a-Dip" chart.

Dense copper deposit helps make a "brain" bright

Since a good memory is vital to computers, IBM plates memory cylinders with the Unichrome Pyrophosphate Copper Process. The deposit from this bath shows an exceptionally smooth, dense deposit of uniform structure.

For the same reason, electronics manufacturers use it in printed circuits. Metallurgists specify it for masking or "stop off" work in nitriding and carburizing operations, since it makes a more impervious shield with thinner deposits. Send for data on M&T's complete line of copper plating processes.

Plastisol seals out corrosion

Unlike plastic sheets, Unichrome "Super 5300" Plastisol poses no seam problems in lining tanks. It sprays on. It therefore protects even sharp bends and complicated shapes. This vinyl compound bakes to a seamless, pore-free coating that maintains a tight "seal" under severely corrosive conditions.

Thicknesses of up to 60 mils per coat can be achieved by spraying . . . in-plant, or at the facilities of applicators in key locations. Send for data.

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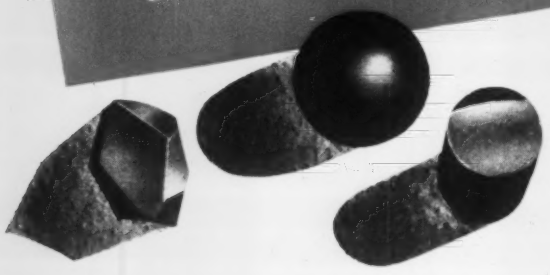

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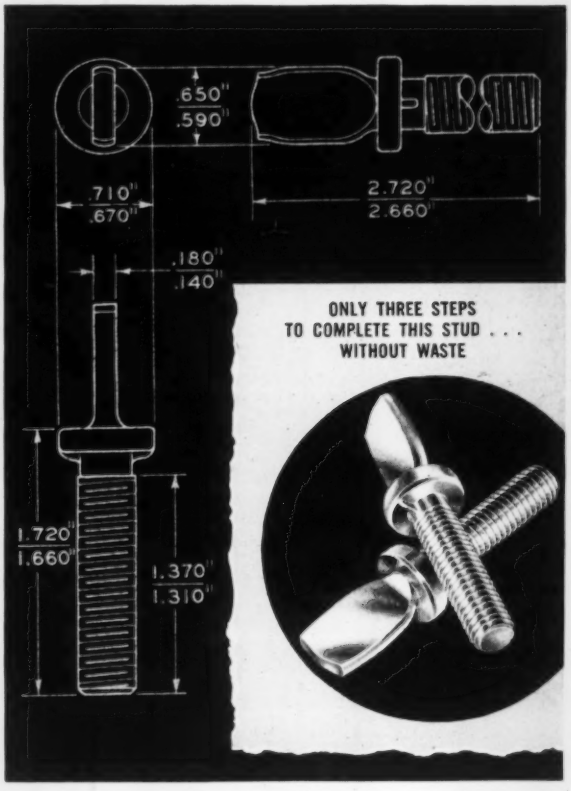

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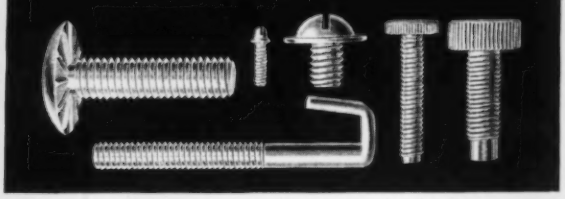

AMONG OPERATIONS PERFORMED BY PROGRESSIVE are heading and extruding simultaneously; flattening; piercing; drilling; bending; pointing; fluted or diamond knurling; trimming; turning tenons, shoulders or recesses; struck or sawed slotting; notching.

STEELMAKING SCRAP PRICE COMPOSITE
Based on No. 1 heavy melting grade at Pittsburgh, Chicago, and eastern Pennsylvania—Compiled by STEEL.
1957
1958
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC
July 23 1958 $37.67
Week Ago $36.67
Month Ago $35.00
Year Ago $54.00
June Avg. $35.50

Scrap Up 4th Week in Row

STEEL's composite on the prime grade rises to $37.67, up another $1. Mill buying lags, but pickup in demand is expected next month as Detroit enters steel market

Scrap Prices, Page 112

Pittsburgh — Dealers are encouraged by reports that automakers are ordering steel for 1959 models. There has been no acceleration in mill buying of scrap, but brokers say smaller consumers are "getting interested." Scrap inventories at foundries are so low any upturn in business would bring a strong demand for the cast grades. Fisher Body Div.'s factory bundles, sold last month at $39.50 a ton, are expected to bring at least $44.

Chicago—Sensitive to better than expected steelmaking operations this month and improved prospects for the rest of the year, the scrap market continues to creep upward. Leading grades, including foundry items, are up $1 a ton over week-ago quotations, and some railroad specialties have advanced $2.

Prices are strong, although sales volume is light, and there is some question whether sellers will be willing to transact much business at present prices. If the market continues to advance, integrated steel mills may increase their use of hot metal, reactivating idle blast furnaces.

New York — With steelmaking tending upward and foreign requirements more active, the scrap market here is strong. But brokers' buying prices are generally unchanged. Exceptions: A $1 advance on low phos structurals and plates to $34 and a firming up in turnings, no longer being quoted on a nominal basis.

Stainless scrap prices are thought likely to advance on the next movement in the market. There is little buying currently.

Philadelphia — Although scrap prices are unchanged, they are strong. Mills are showing more interest in the steelmaking grades, but sellers have light stocks and are not pressing for business in view of the unsettled political situation in the Mideast. Malleable scrap has sold at $58-$59, delivered.

Cleveland—With steelmaking operations holding up better than had been expected, the tone of the scrap market is stronger and prices on the steel grades are up sharply on a representative mill purchase. The local ingot rate (49.5 per cent) is up 3.5 points from a week ago. Expectations are automotive demand for steel will develop in volume next month to give steelmaking a lift. This should bring out a substantial demand for scrap. Prices are up $3 to $4 on the No. 1 grades, and $8 to $9 on No. 2 bundles. Bids on auto lists at month's end are expected to push prices higher.

Youngstown — Scrap remains steady here with dealers and brokers more confident, following a sale of No. 1 heavy melting to an electric furnace operator at $39, up $3 from the previous sale. They look for purchases by others late this month or early next month.

There's plenty of scrap, especially No. 2 quality, in dealer and steel plant yards.

Detroit — Scrap prices are unchanged as dealers and brokers await month-end auto lists, which are expected to move at $3 to $4 above last month's. Only a few orders are reported on the dealer level, and dealer inventories remain high. Still, dealers are confident of a pickup in mill activity as the autobuilders place steel orders for the 1959 model runs.

Buffalo—The tense international situation created a firmer market undertone here last week. But no sales at higher prices were noted. Dealers are reluctant to part with their stocks in view of the Middle East situation. But consumers are not disposed to pay more for scrap. They hold comfortable inventories and can "sit out" an increase in scrap for some time. Dealers think improved steel business and the Mideast crisis may cause scrap to go up shortly.

Cincinnati — Broker buying has pushed scrap prices up $1 on the principal steelmaking grades. No. 1

(Please turn to Page 117)

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Iron and Steel Scrap

Consumer prices per gross ton, except as otherwise noted, including brokers' commission, as reported to STEEL, July 23, 1958. *Changes shown in italics.*

STEELMAKING SCRAP COMPOSITE

July 23	$37.67
July 16	36.67
June Avg.	35.50
July 1957	54.67
July 1953	43.51

Based on No. 1 heavy melting grade at Pittsburgh, Chicago, and eastern Pennsylvania.

PITTSBURGH

No. 1 heavy melting	*37.00-38.00*
No. 2 heavy melting	*31.00-32.00*
No. 1 dealer bundles	*37.00-38.00*
No. 2 bundles	*27.00-28.00*
No. 1 busheling	*37.00-38.00*
No. 1 factory bundles	*42.00-43.00*
Machine shop turnings	*16.00-17.00*
Mixed borings, turnings	*16.00-17.00*
Short shovel turnings	*20.00-21.00*
Cast iron borings	*20.00-21.00*
Cut structurals:	
2 ft and under	*42.00-43.00*
3 ft lengths	*40.00-41.00*
Heavy turnings	*35.00-36.00*
Punchings & plate scrap	*42.00-43.00*
Electric furnace bundles	*42.00-43.00*

Cast Iron Grades

No. 1 cupola	*40.00-41.00*
Stove plate	*40.00-41.00*
Unstripped motor blocks	23.00-24.00
Clean auto cast	39.00-40.00
Drop broken machinery	*49.00-50.00*

Railroad Scrap

No. 1 R.R. heavy melt.	*43.00-44.00*
Rails, 2 ft and under	*54.00-55.00*
Rails, 18 in. and under	*55.00-56.00*
Random rails	*51.00-52.00*
Railroad specialties	*48.00-49.00*
Angles, splice bars	44.00-45.00
Rails, rerolling	58.00-59.00

Stainless Steel Scrap

18-8 bundles & solids	180.00-185.00
18-8 turnings	100.00-105.00
430 bundles & solids	100.00-105.00
430 turnings	50.00-52.00

CHICAGO

No. 1 hvy melt., indus.	*41.00-42.00*
No. 1 hvy melt., dealer	*39.00-40.00*
No. 2 heavy melting	35.00-36.00
No. 1 factory bundles	*45.00-46.00*
No. 1 dealer bundles	*40.00-41.00*
No. 2 bundles	*29.00-30.00*
No. 1 busheling, indus.	*41.00-42.00*
No. 1 busheling, dealer	*39.00-40.00*
Machine shop turnings	20.00-21.00
Mixed borings, turnings	22.00-23.00
Short shovel turnings	22.00-23.00
Cast iron borings	22.00-23.00
Cut structurals, 3 ft	*45.00-46.00*
Punchings & plate scrap	*46.00-47.00*

Cast Iron Grades

No. 1 cupola	*44.00-45.00*
Stove plate	*42.00-43.00*
Unstripped motor blocks	*37.00-38.00*
Clean auto cast	*50.00-51.00*
Drop broken machinery	*50.00-51.00*

Railroad Scrap

No. 1 R.R. heavy melt.	*44.00-45.00*
R.R. malleable	*56.00-57.00*
Rails, 2 ft and under	*59.00-60.00*
Rails, 18 in. and under	*60.00-61.00*
Angles, splice bars	*53.00-54.00*
Axles	*65.00-66.00*
Rails, rerolling	*61.00-62.00*

Stainless Steel Scrap

18-8 bundles & solids	180.00-185.00
18-8 turnings	95.00-100.00
430 bundles & solids	95.00-100.00
430 turnings	50.00-55.00

YOUNGSTOWN

No. 1 heavy melting	*41.00-42.00†*
No. 2 heavy melting	*30.00-31.00†*
No. 1 busheling	*41.00-42.00†*
No. 1 bundles	*41.00-42.00†*
No. 2 bundles	*30.00-31.00†*
Machine shop turnings	12.00-13.00
Short shovel turnings	17.00-18.00
Cast iron borings	17.00-18.00
Low phos.	37.00-38.00
Electric furnace bundles	*42.00-43.00†*

Railroad Scrap

No. 1 R.R. heavy melt.	41.00-42.00

CLEVELAND

No. 1 heavy melting	*38.00-39.00*
No. 2 heavy melting	*26.00-27.00*
No. 1 factory bundles	*41.00-42.00*
No. 1 bundles	*38.00-39.00*
No. 2 bundles	*28.00-29.00*
No. 1 busheling	*38.00-39.00*
Machine shop turnings	9.00-10.00
Short shovel turnings	13.00-14.00
Mixed borings, turnings	13.00-14.00
Cast iron borings	13.00-14.00
Cut foundry steel	37.00-38.00
Cut structurals, plates 2 ft and under	39.00-40.00
Low phos, punchings & plate	34.00-35.00
Alloy free, short shovel turnings	16.00-17.00
Electric furnace bundles	35.50-36.50

Cast Iron Grades

No. 1 cupola	42.00-43.00
Charging box cast	33.00-34.00
Heavy breakable cast	33.00-34.00
Stove plate	43.00-44.00
Unstripped motor blocks	25.00-26.00
Brake shoes	33.00-34.00
Clean auto cast	42.00-43.00
Burnt cast	30.00-31.00
Drop broken machinery	47.00-48.00

Railroad Scrap

R.R. malleable	60.00-61.00
Rails, 2 ft and under	56.00-57.00
Rails, 18 in. and under	57.00-58.00
Rails, random lengths	49.00-50.00
Cast steel	44.00-45.00
Railroad specialties	47.00-48.00
Uncut tires	40.00-41.00
Angles, splice bars	46.00-47.00
Rails, rerolling	51.00-52.00

Stainless Steel

(Brokers' buying prices; f.o.b. shipping point)

18-8 bundles, solids	170.00-175.00
18-8 turnings	95.00-100.00
430 clips, bundles, solids	80.00-90.00
430 turnings	40.00-50.00

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting	33.00
No. 2 heavy melting	30.00
No. 1 bundles	34.00
No. 2 bundles	23.00
No. 1 busheling	33.00
Machine shop turnings	16.00†
Short shovel turnings	18.00†

Cast Iron Grades

No. 1 cupola	43.00
Charging box cast	35.00
Heavy breakable cast	*35.00*
Unstripped motor blocks	*36.00*
Clean auto cast	44.00
Stove plate	*43.00*

Railroad Scrap

No. 1 R.R. heavy melt.	*45.00*
Rails, 18 in. and under	50.00
Rails, random lengths	*48.00*
Rails, rerolling	*58.25*
Angles, splice bars	47.00

BIRMINGHAM

No. 1 heavy melting	*31.00-32.00*
No. 2 heavy melting	*27.00-28.00*
No. 1 bundles	30.00-31.00
No. 2 bundles	19.00-20.00
No. 1 busheling	30.00-31.00
Cast iron borings	12.00-13.00
Machine shop turnings	20.00-21.00
Short shovel turnings	21.00-22.00
Bars, crops and plates	40.00-41.00
Structurals & plates	39.00-40.00
Electric furnace bundles	34.00-35.00
Electric furnace:	
2 ft and under	35.00-36.00
3 ft and under	34.00-35.00

Cast Iron Grades

No. 1 cupola	*52.00-53.00*
Stove plate	51.00-52.00
Unstripped motor blocks	*41.00-42.00*
Charging box cast	22.00-23.00
No. 1 wheels	37.00-38.00

Railroad Scrap

No. 1 R.R. heavy melt.	32.00-33.00
Rails, 18 in. and under	*49.00-50.00*
Rails, rerolling	*56.00-57.00*
Rails, random lengths	44.00-45.00
Angles, splice bars	40.00-41.00

PHILADELPHIA

No. 1 heavy melting	35.00
No. 2 heavy melting	31.00
No. 1 bundles	35.00
No. 2 bundles	24.00
No. 1 busheling	35.00
Electric furnace bundles	36.00
Mixed borings, turnings	17.00†
Short shovel turnings	*20.00*
Machine shop turnings	17.00
Heavy turnings	29.00
Structural & plate	39.00-40.00
Couplers, springs, wheels	43.50
Rail crops, 2 ft & under	55.00-56.00

Cast Iron Grades

No. 1 cupola	38.00
Heavy breakable cast	41.00
Malleable	58.00-59.00
Drop broken machinery	47.00-48.00

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting	30.00-31.00
No. 2 heavy melting	27.00
No. 1 bundles	30.00-31.00
No. 2 bundles	16.00-17.00
Machine shop turnings	8.00-9.00
Mixed borings, turnings	9.00-10.00
Short shovel turnings	11.00-12.00
Low phos (structurals & plates)	*34.00*

Cast Iron Grades

No. 1 cupola	35.00-36.00
Unstripped motor blocks	24.00-25.00
Heavy breakable	33.00-34.00

Stainless Steel

18-8 sheets, clips, solids	155.00-160.00
18-8 borings, turnings	50.00-55.00
410 sheets, clips, solids	50.00-55.00
430 sheets, clips, solids	60.00-65.00

BUFFALO

No. 1 heavy melting	27.00-28.00
No. 2 heavy melting	23.00-24.00
No. 1 bundles	27.00-28.00
No. 2 bundles	21.00-22.00
No. 1 busheling	27.00-28.00
Mixed borings, turnings	13.00-14.00
Machine shop turnings	10.00-11.00
Short shovel turnings	14.00-15.00
Cast iron borings	13.00-14.00
Low phos, structurals and plate, 5 ft and under	32.00-33.00
2 ft and under	36.00-37.00

Cast Iron Grades

(F.o.b. shipping point)

No. 1 cupola	38.00-39.00
No. 1 machinery	42.00-43.00

Railroad Scrap

Rails, random lengths	46.00-47.00
Rails, 3 ft and under	52.00-53.00
Railroad specialties	36.00-37.00

CINCINNATI

(Buyers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*35.00-36.00*
No. 2 heavy melting	*28.50-29.50*
No. 1 bundles	*35.00-36.00*
No. 2 bundles	*23.00-24.00*
No. 1 busheling	*35.00-36.00*
Machine shop turnings	*13.00-14.00*
Mixed borings, turnings	*13.50-14.50*
Short shovel turnings	*15.50-16.50*
Cast iron borings	*13.00-14.00*
Low phos, 18 in.	39.00-40.00

Cast Iron Grades

No. 1 cupola	40.00-41.00
Heavy breakable cast	32.00-33.00
Charging box cast	32.00-33.00
Drop broken machinery	44.00-45.00

Railroad Scrap

No. 1 R.R. heavy melt.	39.00-40.00
Rails, 18 in. and under	52.00-53.00
Rails, random lengths	42.00-43.00

HOUSTON

(Brokers' buying prices; f.o.b. cars)

No. 1 heavy melting	32.00
No. 2 heavy melting	30.00
No. 1 bundles	32.00
No. 2 bundles	21.00†
Machine shop turnings	14.00
Short shovel turnings	17.00
Low phos, plates structurals	*38.50†*

Cast Iron Grades

No. 1 cupola	*42.00*
Heavy breakable	30.00†
Unstripped motor blocks	36.00

Railroad Scrap

No. 1 R.R. heavy melt.	34.00

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	22.00-23.00
No. 2 heavy melting	18.00-19.00
No. 1 bundles	22.00-23.00
No. 2 bundles	14.00-15.00
No. 1 busheling	22.00-23.00
Machine shop turnings	6.00-7.00
Mixed borings, turnings	6.00-7.00
Short shovel turnings	7.00-8.00
No. 1 cast	28.00-29.00
Mixed cupola cast	27.00-28.00
No. 1 machinery cast	36.00-38.00

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	28.00-29.00
No. 2 heavy melting	21.00-22.00
No. 1 bundles	31.00-32.00
No. 2 bundles	18.00-19.00
No. 1 busheling	29.00-30.00
Machine shop turnings	8.00-9.00
Mixed borings, turnings	9.00-10.00
Short shovel turnings	9.00-10.00
Punchings & plate	31.00-32.00

Cast Iron Grades

No. 1 cupola	37.00-38.00
Stove plate	29.00-30.00
Charging box cast	29.00-30.00
Heavy breakable	28.00-29.00
Unstripped motor blocks	16.00-17.00
Clean auto cast	37.00-38.00

SEATTLE

No. 1 heavy melting	30.00†
No. 2 heavy melting	28.00†
No. 1 bundles	22.00†
No. 2 bundles	20.00†
Machine shop turnings	9.00-10.00†
Mixed borings, turnings	9.00-10.00†
Electric furnace No. 1	38.00

Cast Iron Grades

No. 1 cupola	31.00
Heavy breakable cast	28.00
Unstripped motor blocks	23.00
Stove plate (f.o.b. plant)	21.00

LOS ANGELES

No. 1 heavy melting	32.00
No. 2 heavy melting	30.00
No. 1 bundles	28.00
No. 2 bundles	20.00
Machine shop turnings	11.00
Shoveling turnings	11.00
Cast iron borings	11.00
Cut structurals and plate 1 ft and under	45.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	41.00

Railroad Scrap

No. 1 R.R. heavy melt.	32.00

SAN FRANCISCO

No. 1 heavy melting	32.00
No. 2 heavy melting	30.00
No. 1 bundles	30.00
No. 2 bundles	22.00
Machine shop turnings	15.00
Mixed borings, turnings	15.00
Cast iron borings	15.00
Heavy turnings	15.00
Short shovel turnings	15.00
Cut structurals, 3 ft	40.00

Cast Iron Grades

No. 1 cupola	42.00
Charging box cast	34.00
Stove plate	34.00
Heavy breakable cast	28.00
Unstripped motor blocks	31.00
Clean auto cast	40.00
Drop broken machinery	40.00
No. 1 wheels	34.00

HAMILTON, ONT.

No. 1 heavy melting	30.00
No. 2 heavy melting	26.00
No. 1 bundles	30.00
No. 2 bundles	23.00
Mixed steel scrap	25.00
Mixed borings, turnings	15.00
Busheling, new factory:	
Prepared	30.00
Unprepared	24.00
Short steel turnings	19.00

Cast Iron Grades‡

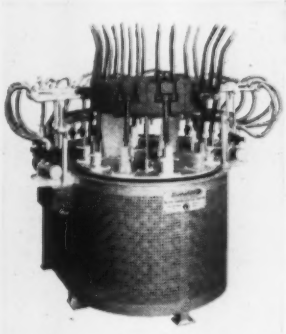
No. 1 machinery cast	45.00-50.00

†Nominal.
‡F.o.b. Hamilton, Ont.

Columbia produces 250 bicycle forks per hour with automatic GAS brazing

Gas brazing is not new to Westfield, where Columbia bicycle frames have been brazed with Gas-fired Selas processing equipment for many years. During this time, pre-placing of brass filler material and automatic heating have limited dependence on operator skill, reduced material waste, and eliminated costly cleanup operations. With the installation of the new Gas brazing machine in their production operation, these advantages have been extended to include fork manufacture, also.

For information on how Gas equipment can help you in your production operations, call your Gas Company's industrial specialist. He'll be glad to discuss the economies and outstanding results you'll get with Gas and modern Gas equipment. *American Gas Association.*



Two fork styles in all standard bicycle sizes are joined from eight steel components on this new automatic Selas machine by Westfield Manufacturing Co., Westfield, Mass. Controlled combustion and flame geometry bring the parts to brazing temperature of 1750°F in only 86 seconds, using economical Gas equipment.

July Doldrums Hit Metals

Normal midsummer slump is affecting all of them. Better sales expected within a few weeks in anticipation of increased buying from Detroit. Price outlook cloudy

Nonferrous Metal Prices, Pages 116 & 117

JULY SHAPES UP as a mediocre month for the nonferrous industry. After registering a small rebound in June, producers find themselves in the traditional midsummer slump. Many of their major customers are shut down for two and three week vacations.

The Mideast situation has done little to sales. Buyers are taking it in stride and doing little hedge purchasing, evidently confident metal supplies will be adequate to meet any foreseeable emergency.

Trading on the commodity exchange has been a bit brisker since American troops went into Lebanon, but this market has been active ever since the administration proposed the Minerals Stabilization Plan.

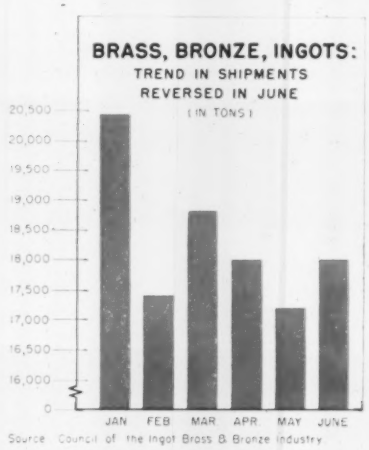
Copper—While sales don't match June's, they aren't bad. Brass mills have been buying hand to mouth, but there has been a stepup in orders from wire and cablemakers. Probable reasons: 1. Housing starts are rising. 2. There's increased demand from motor and transformer people. 3. Some inventory replenishment has taken place. Producers believe demand for power transmission cable will start to spurt in the next few weeks.

Pricewise, the copper industry appears to be on a plateau for a while. Now that all three major producers are quoting 26.5 cents a pound, the independent brass mills and the wire and cablemakers have adjusted their prices accordingly.

Custom smelters now quote the same price as the producers. Sales at this level are only fair, but metalmen believe the price will hold for the present.

Foreign quotations also show greater strength: Katanga is at 25.85 cents, the French price is 26.32 cents, and the London Metal Exchange is around 25.25 cents. Taking into account ocean freight and the 1.7 cent a pound copper excise tax, foreign producers can't profitably bring metal into the U. S., which strengthens the domestic market.

If a workable Minerals Stabilization Bill were to pass Congress, chances are domestic producers would push up quotations 0.5 to 1 cent a pound. Even without passage of the bill, it's possible the industry could maintain its present price. Reason: Production has been cut to the point where normal demand will eat into producers' stocks.



Lead, Zinc — There have been some spotty upturns in lead sales this month, but over-all demand still disappoints producers. Better things are expected in the fall (traditionally the best period for sales) as Detroit begins to roll on 1959 models and the replacement battery market picks up.

Producers report July zinc sales run fair to poor. Galvanizing continues to be the only bright spot in the market. Demand is expected to remain good for the next few months because of the new home market, highway building, and farm construction. Producers expect diecasters to come back into the market in the next few weeks.

The price outlook is cloudy for both metals. Passage of the Minerals Bill could bring some price weakness since it would encourage increased production and would allow producers to lower quotations and still receive more for their metal than they are now getting.

If a workable minerals plan fails to get through this session, look for increased demand from the industry for the President to approve the lead-zinc tariff.

Nickel—Business has tapered off some from the slightly improved position of May and June. Better sales are expected in August.

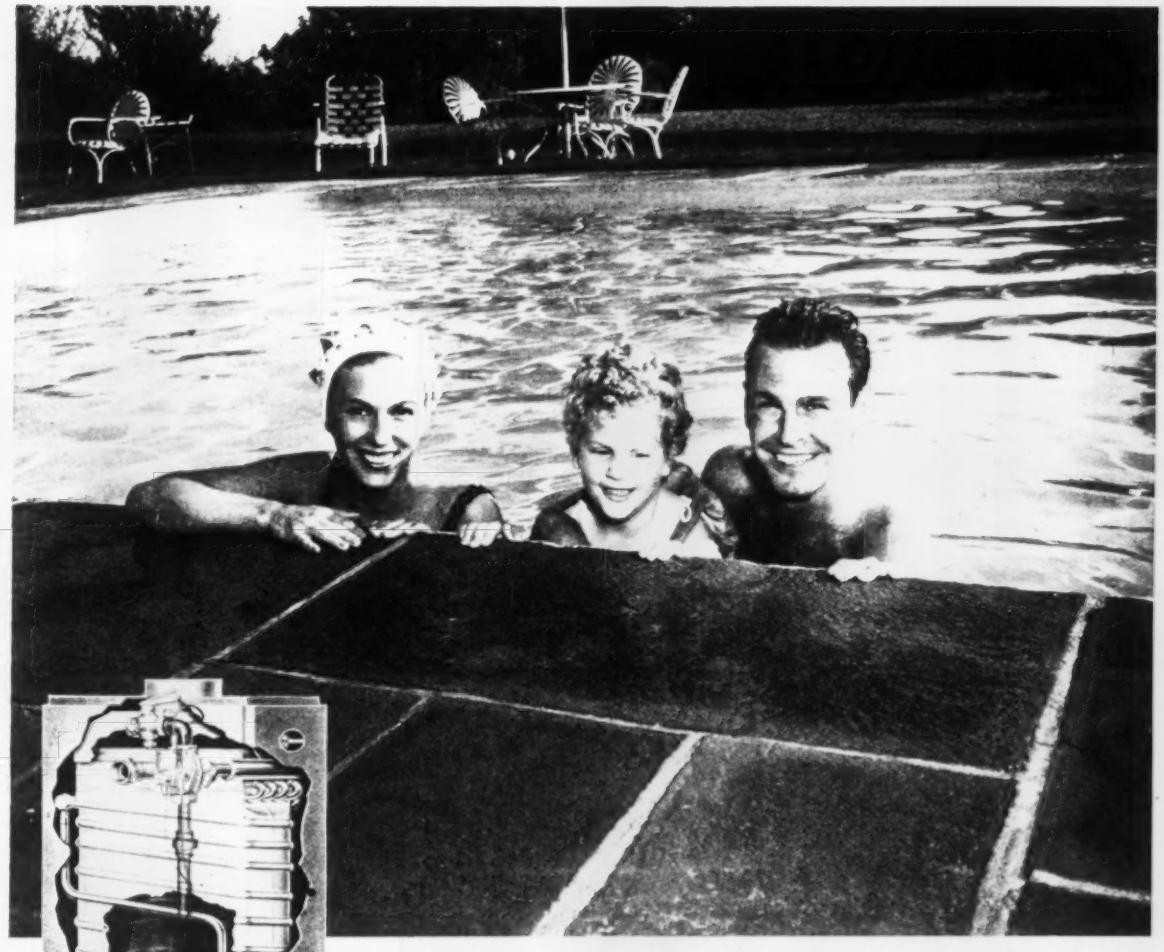
Mounting stocks forced International Nickel Co. to trim output earlier this month. The company is operating at a rate of 200 million lb a year (capacity is 300 million lb).

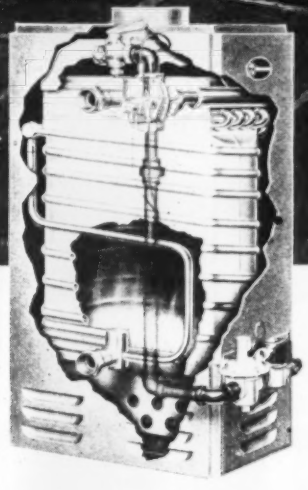
It's rumored the government may order production cutbacks at its processing plant in Nicaro, Cuba. The plant is turning out 50 million to 55 million lb of nickel oxide sinter and powder a year.

NONFERROUS PRICE RECORD

	Price July 23	Last Change	Previous Price	June Avg	May Avg	July, 1957 Avg
Aluminum	24.00	Apr. 1, 1958	26.00	24.000	24.000	25.000
Copper	26.00–26.50	July 17, 1958	26.00–26.50	25.400	24.433	28.822
Lead	10.80	July 1, 1958	11.30	11.040	11.512	13.800
Magnesium	35.25	Aug. 13, 1956	33.75	35.250	35.250	35.250
Nickel	74.00	Dec. 6, 1956	64.50	74.000	74.000	74.000
Tin	95.25	July 23, 1958	95.125	94.701	94.510	96.576
Zinc	10.00	July 1, 1957	10.50	10.000	10.000	10.000

Quotations in cents per pound based on: COPPER, mean of primary and secondary, deld. Conn. Valley; LEAD, common grade, deld. St. Louis; ZINC, prime western, E. St. Louis; TIN, Straits, deld. New York; NICKEL, electrolytic cathodes, 99.9%, base size at refinery, unpacked; ALUMINUM, primary pig, 99.5+%, f.o.b. shipping point; MAGNESIUM, pig, 99.8%, Velasco, Tex.





How To Take The Cool From The Pool With Bridgeport Brass and Copper

A back-yard swimming pool is great fun but often the season seems too short. Today, with a pool heater, you can extend the pleasure of the swimming season from early spring to late fall. One of the leading units of this type is the M/E Universal Heater which supplies automatic instant heat to pool water. The manufacturers, McIntyre Engineering Co., of San Francisco, rely on Bridgeport metals for greater efficiency and dependability in their product.

The M/E Universal is a gas-fired instant heat boiler which keeps swimming pool temperatures at a comfortable 76°. Forming the unit's combustion chamber is Bridgeport copper sheet. Water circulates around the chamber through $\frac{5}{8}$" soft temper Bridgeport copper tube brazed to the sheet, and into a fin-and-tube copper coil at the top.

Copper, of course, is a natural for this kind of equipment. Its resistance to corrosion and excellent thermal conductivity make it especially desirable where heat and moisture are factors. Pool heaters are only one application in which brass and copper perform as no other metal can.

Bridgeport supplies high-quality brass, copper and bronze in a wide range of alloys and forms. Call your nearest Bridgeport Sales Office for help with your product and production needs, or wire us directly at the address below.

Bridgeport BRASS CO.

BRIDGEPORT BRASS

Bridgeport Brass Company, Bridgeport 2, Conn. Sales Offices in Principal Cities. In Canada: Noranda Copper and Brass Limited, Montreal

Nonferrous Metals

Cents per pound, carlots except as otherwise noted.

PRIMARY METALS AND ALLOYS

Aluminum: 99.5%, pigs, 24.00; ingots, 26.10, 30,000 labor more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 27.90; No. 43, 27.70; No. 195, 28.70; No. 214, 29.50; No. 356, 27.90, 30-lb ingots.

Antimony: R.M.M. brand, 99.5%, 29.00; Lone Star brand, 29.50; f.o.b. Laredo, Tex., in bulk. Foreign brands, 99.5%, 23.50-24.50, New York, duty paid, 10,000 lb or more.

Beryllium: 97% lump or beads, $71.50 per lb, f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $74.75 per lb of contained Be, with balance as Al at market price, f.o.b. shipping point.

Beryllium Copper: 3.75-4.25% Be, $43 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. shipping point.

Bismuth: $2.25 per ton, ton lots.
Cadmium: Sticks and bars, $1.55 per lb deld.
Cobalt: 97.99%, $2.00 per lb for 550-lb keg; $2.02 per lb for 100 lb case; $2.07 per lb under 100 lb.

Columbium: Powder, $55-85 per lb, nom.

Copper: Electrolytic, 26.50 deld.; custom smelters, 26.50; lake, 26.50 deld.; fire refined, 26.25 deld.

Germanium: First reduction, $179.17-197.31 per lb; intrinsic grade, $197.31-220 per lb, depending on quantity.

Gold: U. S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $70-80 nom. per troy oz.

Lead: Common, 10.80; chemical, 10.90; corroding, 10.90, St. Louis, New York basis, add 0.20.

Lithium: 98 + %, 50-100 lb, cups or ingots, $12; rod, $15; shot or wire, $16. 100-500 lb, cups or ingots, $10.50; rod, $14; shot or wire, $15, f.o.b. Minneapolis.

Magnesium: Pig, 35.25; ingot, 36.00 f.o.b. Velasco, Tex.; 12 in. thick, 59.00 f.o.b. Madison, Ill.

Magnesium Alloys: AZ91A (diecasting), 40.75 deld.; AZ63A, AZ92A, AZ91C (sand casting), 40.75, f.o.b. Velasco, Tex.

Mercury: Open market, spot, New York, $228-230 per 76-lb flask.

Molybdenum: Unalloyed, turned extrusions, 3.75-5.75 in. round, $9.60 per lb in lots of 2500 lb of more, f.o.b. Detroit.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked, 74.00; 10-lb pigs, unpacked, 78.25; "XX" nickel shot, 79.50; "F" nickel shot for addition to cast iron, 74.50; "F" nickel, 5 lb ingots in kegs for addition to cast iron, 75.50. Prices f.o.b. Port Colborne, Ont., including import duty. New York basis, add 1.01. Nickel oxide sinter at Buffalo, New York, or other established U. S. points of entry, contained nickel, 69.60.

Osmium: $70-100 per troy oz nom.

Palladium: $19-21 per troy oz.

Platinum: $62-65 per troy oz from refineries.

Radium: $16-21.50 per mg radium content, depending on quantity.

Rhodium: $118-125 per troy oz.

Ruthenium: $45-55 per troy oz.

Selenium: $7.00 per lb, commercial grade.

Silver: Open market 88.625 per troy oz.

Sodium: 17.00, c.l.; 19.00-19.50 l.c.l.

Tantalum: Rod, $60 per lb; sheet, $55 per lb.

Tellurium: $1.65-1.85 per lb.

Thallium: $7.50 per lb.

Tin: Straits, N. Y., spot and prompt, 95.25.

Titanium: Sponge, 99.3+ % grade A-1, ductile (0.3% Fe max.), 2.05; grade A-2 (0.5% Fe max.), $1.85 per lb.

Tungsten: Powder, 98.8%, carbon reduced, 1000-lb lots, $3.15 per lb nom., f.o.b. shipping point; less than 1000 lb, add 15.00; 99 + % hydrogen reduced, $3.85.

Zinc: Prime Western, 10.00; brass special, 10.25; intermediate, 10.50, East St. Louis, freight allowed over 0.50 per lb. New York basis, add 0.50. High grade, 11.00; special high grade, 11.25 deld. Diecasting alloy ingot No. 3, 12.75; No. 2, 13.25; No. 5, 13.00 deld.

Zirconium: Sponge, commercial grade, $5-10 per lb.

(Note: Chromium, manganese, and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston alloys, 22.50-24.00; No. 12 foundry alloy (No. 2 grade), 21.25-21.50; 5% silicon alloy, 0.60 Cu max., 24.00-24.25; 13 alloy 0.60 Cu max., 24.00-24.25; 195 alloy, 24.25-25.50; 108 alloy, 21.75. Steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 22.25; grade 2, 21.25; grade 3, 20.00; grade 4, 17.25.

Brass Ingot: Red brass, No. 115, 27.00; tin bronze, No. 225, 36.00; No. 245, 30.75; high-leaded tin bronze, No. 305, 31.25; No. 1 yellow, No. 405, 22.75; manganese bronze, No. 421, 24.50.

Magnesium Alloy Ingot: AZ63A, 37.50; AZ91B, 37.50; AZ91C, 41.25; AZ92A, 37.50.

NONFERROUS PRODUCTS

BERYLLIUM COPPER

(Base prices per lb, plus mill extras, 2000 to 5000 lb; nom. 1.9% Be alloy.) Strip, $1.80, f.o.b. Template, Pa., or Reading, Pa.; rod, bar, wire, $1.78, f.o.b. Temple, Pa.

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 20,000-lb lots, 31.855; l.c.l., 32.48. Weatherproof, 20,000-lb lots, 33.66, l.c.l., 34.41, before quantity discounts.

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh.) Sheets, full rolls, 140 sq ft or more, $15.50 per cwt; pipe, full coils, $15.50 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill.) Sheets and strip, $8.50-15.95; sheared mill plate, $6.00-9.50; wire, $6.50-11.00; forging billets, $4.10-4.35; hot-rolled and forged bars, $5.25-6.35.

ZINC

(Prices per lb, c.l., f.o.b. mill.) Sheets, 24.00; ribbon zinc in coils, 20.50; plates, 19.00.

ZIRCONIUM

Plate, $12.50-19.20; H.R. strip, $12.50-22.90; C.R. strip, $15.90-31.25; forged or H.R. bars, $11.00-17.40.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheets, C.R.	126	106	128
Strips, C.R.	124	108	138
Plate, H.R.	120	105	121
Rod, Shapes, H.R.	107	89	109
Seamless Tubes	157	129	200

ALUMINUM

Sheets: 1100, 3003, and 5005 mill finish (30,000 lb base; freight allowed).

Thickness Range, Inches	Flat Sheet	Coiled Sheet
0.249-0.136	41.10-45.60	.....
0.135-0.096	41.60-46.70	.....
0.125-0.096	.....	38.50-39.10
0.096-0.077	42.30-48.50	38.60-39.30
0.076-0.061	42.90-50.80	38.80-40.00
0.060-0.048	43.60-53.10	39.40-41.10
0.047-0.038	44.20-55.90	39.90-32.50
0.037-0.030	44.60-60.90	40.30-44.30
0.029-0.024	45.20-52.70	40.60-45.00
0.023-0.019	46.20-56.10	41.70-43.40
0.018-0.017	47.00-53.40	42.30-44.00
0.016-0.015	47.90-54.30	43.10-44.80
0.014	48.90	44.10-45.80
0.013-0.012	50.10	44.80
0.011	51.10	46.00
0.010-0.0095	52.60	47.40
0.009-0.0085	53.90	48.90
0.008-0.0075	55.50	50.10
0.007	57.00	51.60
0.006	58.60	53.00

ALUMINUM (continued)

Plates and Circles: Thickness 0.250-3 in., 24-60 in. width or diam., 72-240 in. lengths.

Alloy	Plate Base	Circle Base
1100-F, 3003-F	41.70	46.50
5050-F	42.80	47.60
3004-F	43.80	49.50
5052-F	44.40	50.20
6061-T6	44.90	51.00
2024-T4	48.60	55.40
7075-T6*	56.40	64.00

*24-48 in. width or diam., 72-180 in. lengths.

Screw Machine Stock: 30,000 lb base.

Diam. (in.) or across flats	Round 2011-T3	Round 2017-T4	Hexagonal 2011-T3	Hexagonal 2017-T4
Drawn				
0.125	76.20	73.20	....	....
0.156	64.20	61.40	....	....
0.172	....	61.40	....	....
0.188	64.20	61.40	....	79.60
0.203	64.20	61.40	....	....
0.219-0.234	61.00	59.50	....	....
0.250	61.00	59.50	88.40	75.90
0.266-0.281	61.00	59.50	....	....
0.313	61.00	59.50	81.40	72.20
0.344	60.50	....	81.40	....
Cold-Finished				
0.375-0.547	60.50	59.30	72.80	67.80
0.563-0.688	60.50	59.30	69.10	63.50
0.719	....	57.70	....	....
0.750-1.000	59.00	57.70	62.90	59.70
1.063	59.00	57.70	....	57.60
1.250-1.500	56.60	55.40	60.80	57.60
Rolled				
1.563	55.00	53.70	....	....
1.625-2.000	54.30	52.90	59.60	55.50
2.063	....	51.40	....	....
2.125-2.500	52.80	51.40	....	55.50
2.500-3.000	51.20	49.70	....	55.50
3.250-3.375	....	49.70	....	....

Forging Stock: Round, Class 1, random lengths, diam. 0.688-8 in., "F" temper; 2014, 41.50-54.30; 6061, 40.90-54.30; 7075, 42.90-56.30; 7079, 43.40-56.80.

Pipe: ASA schedule 40, alloy 6063-T6, standard lengths, plain ends, 90,000 lb base, dollars per 100 ft. Nominal pipe sizes: ¾ in., 18.60; 1 in., 29.35; 1¼ in., 39.75; 1½ in., 47.50; 2 in., 57.40; 4 in., 157.60; 6 in., 282.95; 8 in., 425.80.

Extruded Solid Shapes:

Factor	Alloy 6063-T5	Alloy 6062-T6
9-11	42.00-43.50	58.60-62.80
12-14	42.00-43.50	59.30-63.80
15-17	42.00-43.50	60.50-65.50
18-20	42.50-44.00	62.50-68.10

MAGNESIUM

Sheet and Plate: AZ31B standard grade, 0.32 in., 103.10; .081 in., 77.90; .125 in., 70.40; .188 in., 69.00; .250-2.0 in., 67.90. AZ31B spec. grade, .032 in., 171.30; .081 in., 108.70; .125 in., 98.10; .188 in., 95.70; .250-2.00 in., 93.30. Tread plate, 60-192 in. lengths, 24-72 in. widths; .125 in., 74.90; .188 in., 71.70-72.70; .25-.75 in., 70.60-71.60. Tooling plate, .25-3.0 in., 73.00.

Extruded Solid Shapes:

Factor	Com. Grade (AZ31C)	Spec. Grade (AZ31B)
6-8	69.60-72.40	84.60-87.40
12-14	70.70-73.00	85.70-88.00
24-26	75.60-76.30	90.60-91.30
36-38	89.20-90.30	104.20-105.30

NONFERROUS SCRAP

DEALER'S BUYING PRICES

(Cents per pound, New York, in ton lots.)

Copper and Brass: No. 1 heavy copper and wire, 19.75-20.25; No. 2 heavy copper and wire, 18.00-18.50; light copper, 16.00-16.50; No. 1 composition red brass, 16.00-16.50; No. 1 com-

BRASS MILL PRICES

	MILL PRODUCTS a				SCRAP ALLOWANCES e (Based on copper at 26.50c)		
	Sheet, Strip, Plate	Rod	Wire	Seamless Tubes	Clean Heavy	Rod Ends	Clean Turnings
Copper	49.63b	46.86c	....	49.82	22.500	22.500	21.750
Yellow Brass	43.57	30.28d	44.11	46.48	17.000	16.750	15.250
Low Brass, 80%	46.03	45.97	46.57	48.84	19.000	18.750	18.250
Red Brass, 85%	46.89	46.83	47.43	49.70	19.750	19.500	19.000
Com. Bronze, 90%	48.30	48.24	48.84	50.86	20.625	20.375	19.875
Manganese Bronze	51.52	45.74	56.18	....	15.875	15.625	14.875
Muntz Metal	45.95	41.76	....	....	15.875	15.625	15.125
Naval Brass	47.83	42.14	54.89	50.99	15.625	15.375	14.875
Silicon Bronze	54.37	53.56	54.41	56.29	22.125	21.875	21.125
Nickel Silver, 10%	58.82	61.15	61.15	....	22.000	21.750	11.000
Phos. Bronze, A-5%	68.59	69.09	69.09	70.27	23.375	23.125	22.125

a. Cents per lb, f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. Prices in cents per lb for less than 20,000 lb, f.o.b. shipping point. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb.

positions turnings, 15.00-15.50; new brass clippings, 13.50-14.00; light brass, 9.50-10.00; heavy yellow brass, 11.00-11.50; new brass rod ends, 11.50-12.00; auto radiators, unsweated, 12.00-12.50; cocks and faucets, 13.00-13.50; brass pipe, 13.00-13.50.

Lead: Heavy, 6.75-7.25; battery plates, 2.50-2.75; linotype and stereotype, 9.25-9.75; electrotype, 7.50 8.00; mixed babbitt, 9.00-9.50.

Monel: Clippings, 28.00-29.00; old sheets, 25.00-26.00; turnings, 20.00-23.00; rods, 28.00-29.00.

Nickel: Sheets and clips, 42.00-45.00; rolled anodes, 42.00-45.00; turnings, 37.00-40.00; rod ends, 42.00-45.00.

Zinc: Old zinc, 3.00-3.25; new diecast scrap, 2.75-3.00; old diecast scrap, 1.50-1.75.

Aluminum: Old castings and sheets, 9.50-10.00; clean borings and turnings, 6.00-6.50; segregated low copper clips, 13.00-13.50; segregated high copper clips, 12.00-12.50; mixed low copper clips, 13.00-14.00; mixed high copper clips, 11.00-11.50.

(Cents per pound, Chicago)

Aluminum: Old castings and sheets, 10.50-11.00; clean borings and turnings, 9.50-10.00; segregated low copper clips, 16.00-16.50; segregated high copper clips, 14.50-15.00; mixed low copper clips, 15.00-15.50; mixed high copper clips, 14.00-14.50.

(Cents per pound, Cleveland)

Aluminum: Old castings and sheets, 9.00-9.50; clean borings and turnings, 8.00-8.50; segregated low copper clips, 12.50-13.00; segregated high copper clips, 11.00-11.50; mixed low copper clips, 11.50-12.00; mixed high copper clips, 10.50-11.00.

REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)

Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5 % Be, 52.50; light scrap, 47.50; turnings and borings, 32.50.

Copper and Brass: No. 1 heavy copper and wire, 22.50; No. 2 heavy copper and wire, 21.50; light copper, 19.25; refinery brass (60% copper) per dry copper content, 21.00.

INGOTMAKERS' BUYING PRICES

Copper and Brass: No. 1 heavy copper and wire, 22.50; No. 2 heavy copper and wire, 21.50; light copper, 19.25; No. 1 composition borings, 19.00; No. 1 composition solids, 19.50; heavy yellow brass solids, 13.50; yellow brass turnings, 12.50; radiators, 15.50.

PLATING MATERIALS

(F.o.b. shipping point, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes, $1.55

Copper: Flat-rolled, 43.29; oval, 41.50, 5000-10,000 lb; electrodeposited, 35.25, 2000-5000 lb lots; cast, 37.75, 5000-10,000 lb quantities.

Nickel: Depolarized, less than 100 lb, 114.25; 100-499 lb, 112.00; 500-4999 lb, 107.50; 5000-29,999 lb, 105.25; 30,000 lb, 103.00. Carbonized, deduct 3 cents a lb.

Tin: Bar or slab, less than 200 lb, 113.50; 200-499 lb, 112.00; 500-999 lb, 111.50; 1000 lb or more, 111.00.

Zinc: Balls, 16.00; flat tops, 16.00; flats, 19.25; ovals, 18.50, ton lots.

CHEMICALS

Cadmium Oxide: $1.55 per lb in 100-lb drums.

Chromic Acid (flake): 100-2000 lb, 31.00; 2000-10,000 lb, 30.50; 10,000-20,000 lb, 30.00; 20,000 lb or more, 29.50.

Copper Cyanide: 100-200 lb, 65.90; 300-900 lb, 63.90; 1000-19,900 lb, 61.90.

Copper Sulphate: 100-1900 lb, 13.70; 2000-5900 lb, 11.70; 6000-11,900 lb, 11.45; 12,000-22,900 lb, 11.20; 23,000 lb or more, 10.70.

Nickel Chloride: 100 lb, 48.50; 200 lb, 46.50; 300 lb, 45.50; 400-999 lb, 43.50; 10,000 lb or more, 40.50.

Nickel Sulphate: 5000-22,000 lb, 29.00; 23,000-35,900 lb, 28.50; 36,000 lb or more, 28.00.

Sodium Cyanide (Cyanobrik): 200 lb, 20.80; 400-800 lb, 19.80; 1000-19,800 lb, 18.80; 20,000 lb or more, 17.80.

Sodium Stannate: Less than 100 lb, 75.80; 100-600 lb, 66.80; 700-1900 lb, 64.00; 2000-9900 lb, 62.20; 10,000 lb or more, 60.80.

Stannous Chloride (anhydrous): 10 lb, 100.757; 25 lb, 100.507; 100 lb, 100.459; 400 lb, 100.434; 800-19,900 lb, 100,026; 20,000 lb or more, 96.50.

Stannous Sulphate: Less than 50 lb, 100.361; 50 lb, 100.061; 100-1900 lb, 100.041; 2000 lb or more, 100.021.

Zinc Cyanide: 100-200 lb, 59.00; 300-900 lb, 57.00.

(Concluded from Page 111)

heavy melting is quoted at $35-$36. Slow generation of material because of vacation shutdowns and fairly strong mill demand are reflected in the new show of market strength. A local mill is reported planning to reactivate open hearth furnaces that have been idle more than six months.

Birmingham — A nearby mill bought No. 2 heavy melting steel last week, paying $2 a ton more than it paid on its last purchase. A railroad list was up $4 a ton. Little of the material was taken by local buyers. No. 1 cast also advanced $1. Some buyers are reported paying above the local price for shipments from remote areas. Local dealers continue reluctant to sell at current prices.

St. Louis—Scrap prices are higher. Cast grades are quoted up about $1 a ton, while advances on the railroad grades range up to $8.50 on No. 1 railroad heavy melting. Other railroad grades are up $2.25 and $2.50 a ton.

Dealer scrap is moving to outside points at prices as much as $6 a ton above those recently quoted. Local mills are paying higher prices for quality dealer scrap coming in from the outside and are forced to compete with outside mills for local dealer tonnage.

Houston — Mill inventories are substantial in the Southwest, and

CLASSIFIED ADVERTISING

ISOLATED TUBE PLANT For Sale!

Land, building and equipment—a M2 Yoder Mill, capacity 2½" O.D. x .083 gage, located on a country cross road 25 miles from a metropolitan area, in N.E., Ohio with farmers for employees.

This can be the lowest cost mill in its area,—one of the country's leading tube consuming districts. The Plant just recently closed and can be started up by throwing a switch. Inspection is invited. If you prefer a mill that you can install in your present location,—We have that also. Write to Hetz Liquidation Service, P. O. Box 671, Warren, Ohio.

Help Wanted

STEEL AND ALLOY PLATE FABRICATOR—Wants Personnel experienced in Pressure Vessel and Tank Work, background in Shop Management with experience in all procedures, methods and organization. Plant near St. Louis has growth situation for Superintendent and Engineer. Reply Box 679, STEEL, Penton Bldg., Cleveland 13, Ohio.

WANTED ENGINEER-SALESMAN-ESTIMATOR experienced in Heating, Ventilating and Industrial Fields. Location Western New York. Reply full resume Box 680, STEEL, Penton Bldg., Cleveland 13, Ohio.

CLASSIFIED RATES

All classifications other than "Positions Wanted" set solid, 50 words or less $15.00, each additional word .30, all capitals, 50 words or less $19.20, each additional word .38; all capitals leaded, 50 words or less $23.40, each additional word .47. "Positions Wanted" set solid, 25 words or less $3.60, each additional word .14, all capitals, 25 words or less $4.50, each additional word .18; all capitals leaded, 25 words or less $5.40, each additional word .22. Keyed address takes seven words. Cash with order necessary on "Positions Wanted" advertisements. Replies forwarded without charge. Displayed classified rates on request. Address your copy and instructions to STEEL, Penton Building, Cleveland 13, Ohio.

FOR SALE

2—G. E. Furnaces for Brazing, Heat Treating or Sintering Hand Pusher Type, complete with cooling chamber, atmosphere generator, controls and transformers. 2100°F, 50 KW, 440 Volt. Good condition. Very Reasonable price.

TRAYER PRODUCTS, INCORPORATED
Elmira, New York

WANTED

One electric, direct arc, steel melting, swing roof top charge tilting furnace with shell diameter 13 to 15 feet, complete with control and regulator panels, and transformer with 8,000 to 12,000 capacity, primary voltage 13.2 KV, secondary range 100 to 300 volts approximately. Must be in first class condition throughout.

Reply Box 678, STEEL
Penton Bldg. Cleveland 13, Ohio

Gears with long useful lives . . .
the result of *high quality at H&S**

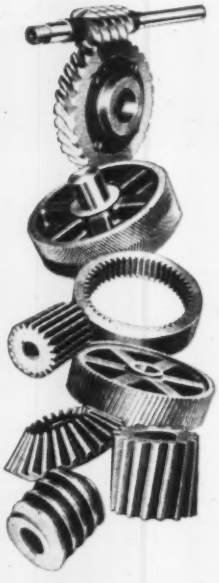
***Quality materials**
***Modern tooling**
***Superior workmanship**

Highly appreciated by the paper mill industry, for instance, are the large spur gears such as the one shown here. This gear has 140 teeth of 2 diametral pitch and 8″ face. It is being completed on a 100″ Fellows Gear Shaper that generates high quality external and internal spur gears up to 8″ face and 1½ D.P.

The modern Horsburgh & Scott plant is equipped with many new precision tools to meet today's demand for higher quality industrial gearing. You can judge our ability to serve you by these examples of size range:

Spur gears up to 156″ diameter
Helical gears up to 100″ diameter
Sykes Herringbone gears up to 60″ diameter
Bevel gears up to 77″ diameter
Worm gears up to 60″ diameter

You benefit by the exacting care that we exercise in every manufacturing step. Tell us your requirements; quotations will be sent by return mail.



A request on your company letterhead will bring a copy of the new H&S Gear Catalog 57 to help you design and order industrial gears.

THE HORSBURGH & SCOTT CO.
GEARS AND SPEED REDUCERS
5112 Hamilton Avenue
Cleveland 14, Ohio

the district scrap market continues quiet. Once-strong Mexican demand has faded. Despite the sluggishness, the market undertone is stronger, reflecting dealer expectations of an upturn in demand in the fall.

Seattle—The scrap market here is unchanged. With mill operations off, scrap consumption is down from that in June. Few sales have been made; prices are nominal. Export market activity is practically nil.

Los Angeles—Scattered buying is reported by district scrap dealers. But only small tonnage is involved. Area steel mills have curtailed steelmaking operations.

San Francisco — Little scrap is moving into or out of local dealers' yards. Market prospects for an early pickup are not promising.

Washington — Consumption of ferrous scrap during May totaled 3,861,000 gross tons, the largest monthly total since January, reports the U. S. Bureau of Mines. Total consumption of ferrous materials (scrap and pig iron) was 7,554,000 tons, of which 3,693,000 tons were pig iron.

Domestic stocks of ferrous materials at the end of May totaled 11,650,000 tons (8,148,000 scrap, 3,502,000 pig iron). The total was down 2 per cent from the 11,850,000 held at the end of April. Ferrous scrap stocks were up slightly, but pig iron stocks were off about 3 per cent.

Accepts Lower Scrap Rate

The Chicago, Milwaukee, St. Paul & Pacific Railroad has filed notice with the Western Trunk Line Committee and the Traffic Executive Committee, Illinois Freight Association, to put into effect a 3 per cent increase on freight rates for scrap (maximum 40 cents). It would be in lieu of a flat 40 cent per ton increase, which was tentatively approved last February by the Interstate Commerce Commission.

It is the second midwest railroad to accept the freight compromise proposed by the Institute of Scrap Iron & Steel Inc., Washington. The first was the Chicago & North Western. Members of the Southern Freight Association have voted in favor of the proposal.

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VIGILANCE

The final victory over cancer will come from the research laboratory.

But there is a more immediate victory at hand today. Many cancers can be cured when detected early and treated promptly. *Vigilance* is the key to this victory.

There are certain signs which might mean cancer. Vigilance in heeding these danger signals could mean victory over cancer for you:

1. Unusual bleeding or discharge.
2. A lump or thickening in the breast or elsewhere.
3. A sore that does not heal.
4. Change in bowel or bladder habits.
5. Hoarseness or cough.
6. Indigestion or difficulty in swallowing.
7. Change in a wart or mole.

If your signal lasts longer than two weeks, go to your doctor to learn if it means cancer.

AMERICAN CANCER SOCIETY®

This announcement is neither an offer to sell nor a solicitation of an offer to buy any of these Debentures. The offer is made only by the Prospectus.

$300,000,000

United States Steel Corporation

4% Sinking Fund Debentures Due 1983

Dated July 15, 1958 — *Due July 15, 1983*

Interest payable January 15 and July 15 in New York City

Price 100½% and Accrued Interest

Copies of the Prospectus may be obtained in any State from only such of the undersigned as may legally offer these Debentures in compliance with the securities laws of such State.

MORGAN STANLEY & CO.

DILLON, READ & CO. INC. — *THE FIRST BOSTON CORPORATION* — *KUHN, LOEB & CO.*

BLYTH & CO., INC. — *DREXEL & CO.* — *EASTMAN DILLON, UNION SECURITIES & CO.*

GLORE, FORGAN & CO. — *GOLDMAN, SACHS & CO.* — *HARRIMAN RIPLEY & CO. Incorporated*

KIDDER, PEABODY & CO. — *LAZARD FRERES & CO.* — *LEHMAN BROTHERS*

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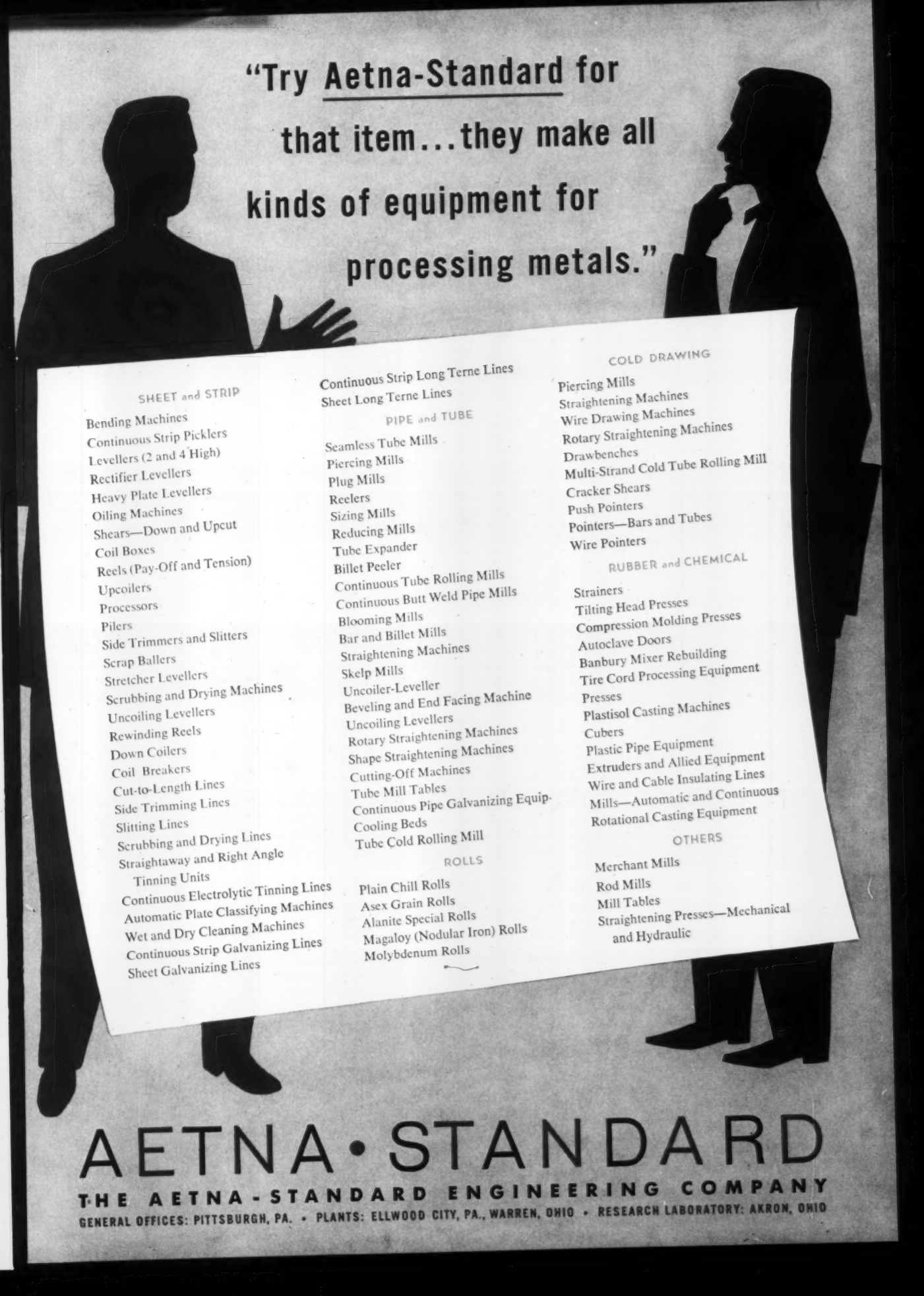
SMITH, BARNEY & CO. — *STONE & WEBSTER SECURITIES CORPORATION*

WHITE, WELD & CO. — *DEAN WITTER & CO.*

July 16, 1958.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that item...they make all
kinds of equipment for
processing metals."
SHEET and STRIP
Bending Machines
Continuous Strip Picklers
Levellers (2 and 4 High)
Rectifier Levellers
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Oiling Machines
Shears—Down and Upcut
Coil Boxes
Reels (Pay-Off and Tension)
Upcoilers
Processors
Pilers
Side Trimmers and Slitters
Scrap Ballers
Stretcher Levellers
Scrubbing and Drying Machines
Uncoiling Levellers
Rewinding Reels
Down Coilers
Coil Breakers
Cut-to-Length Lines
Side Trimming Lines
Slitting Lines
Scrubbing and Drying Lines
Straightaway and Right Angle
Tinning Units
Continuous Electrolytic Tinning Lines
Automatic Plate Classifying Machines
Wet and Dry Cleaning Machines
Continuous Strip Galvanizing Lines
Sheet Galvanizing Lines
Continuous Strip Long Terne Lines
Sheet Long Terne Lines
PIPE and TUBE
Seamless Tube Mills
Piercing Mills
Plug Mills
Reelers
Sizing Mills
Reducing Mills
Tube Expander
Billet Peeler
Continuous Tube Rolling Mills
Continuous Butt Weld Pipe Mills
Blooming Mills
Bar and Billet Mills
Straightening Machines
Skelp Mills
Uncoiler-Leveller
Beveling and End Facing Machine
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Tube Cold Rolling Mill
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Asex Grain Rolls
Alanite Special Rolls
Magaloy (Nodular Iron) Rolls
Molybdenum Rolls
COLD DRAWING
Piercing Mills
Straightening Machines
Wire Drawing Machines
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Multi-Strand Cold Tube Rolling Mill
Cracker Shears
Push Pointers
Pointers—Bars and Tubes
Wire Pointers
RUBBER and CHEMICAL
Strainers
Tilting Head Presses
Compression Molding Presses
Autoclave Doors
Banbury Mixer Rebuilding
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Presses
Plastisol Casting Machines
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Plastic Pipe Equipment
Extruders and Allied Equipment
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Mill Tables
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and Hydraulic
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THE AETNA-STANDARD ENGINEERING COMPANY
GENERAL OFFICES: PITTSBURGH, PA. • PLANTS: ELLWOOD CITY, PA., WARREN, OHIO • RESEARCH LABORATORY: AKRON, OHIO

it was a fully automatic forging operation... until we started to forge

Even the best automatic forging machines can be slowed down by one simple thing. The steel you forge.

Unless the steel is really uniform, you'll be interrupting production to change the setup. These readjustments take time, limit the availability of expensive equipment—until it's hardly automatic any more.

With Timken® steel you get uniformity down to the last ounce. We take extra steps to make our steel uniform from bar to bar, heat to heat, order to order. For instance, we use the industry's first magnetic stirrer. It distributes alloys evenly, works the slag constantly at a uniform temperature. And we eliminate guesswork by using the industry's first direct-reading spectrometer to insure more uniform grain size and chemical composition.

What's more, we treat each order individually. Right from the start, an order is processed with the customer's end use in mind.

Why not insure wide-open, fully-automatic operation with your machines? Specify Timken fine alloy steel. You'll get uniform results every time without paying a penny extra. The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable address: "TIMROSCO".

TIMKEN *Fine Alloy* **STEEL**

TRADE MARK REG. U.S. PAT. OFF.

SPECIALISTS IN FINE ALLOY STEELS, GRAPHITIC TOOL STEELS AND SEAMLESS STEEL TUBING